JPRS 73859

18 July 1979

USSR Report

RESOURCES

No. 883

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available through Bell & Howell, Old Mansfield Road, Wooster, Ohio, 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. JPRS 73859	2.	3. Recipient's Accession No.
4. Title and Subtitle USSR REPORT: RESOURCES, No. 883			5. Report Date 18 July 1979 6.
7. Author(s)			8. Performing Organization Rept. No.
9. Performing Organization Name and Address Joint Publications Research Service 1000 North Glebe Road Arlington, Virginia 22201			10. Project/Task/Work Unit No. 11. Contract(C) or Grant(G) No. (C) (G)
12. Sponsoring Organization Name and Address As above			13. Type of Report & Period Covered 14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This serial report contains information on energy, fuels and related equipment; fishing industry and marine resources; water resources, minerals, timber, and electric power and power equipment.

17. Document Analysis a. Descriptors

USSR
Natural Resources
Electric Power
Energy
Energy Conservation
Fisheries
Fuels
Minerals
Timber
Forestry
Water Supply

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group 2C, 2F, 5C, 8G, 10, 21D

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
Unlimited Availability Sold by NTIS Springfield, Virginia 22161	UNCLASSIFIED	76
	20. Security Class (This Page) UNCLASSIFIED	22. Price

(See ANSI-Z39.18) See Instructions on Reverse

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

JPRS 73859

18 July 1979

USSR REPORT

RESOURCES

No. 883

CONTENTS

CONTENTS (Continued) Page

CONTENTS (Continued) Page

MINERALS

ELECTRIC POWER AND POWER EQUIPMENT

SOCIALIST COMPETITION OF POWER WORKERS

Moscow ENERGETIK in Russian No 5, 1979 pp 1-2

[Editorial: "Inspired Shock Labor -- To the Shock Year"]

[Text] Fifty years ago the Soviet people undertook to implement the First Five-Year Plan. Since that time, five-year plans have become the main tool for bringing to life the economic policy of the party and the Soviet government. The 10th Five-Year Plan is a new important stage in realizing the general line of Lenin's party on building communism.

The 25th party congress posed the main problem of the party for the current five-year plan period and for a long-range period -- improving further the welfare of the Soviet people, improving their labor and everyday living conditions, considerable progress in health care, culture and everything else that facilitates the shaping of a new man, the all-around development of personality and improvement in the socialist form of life.

The main line of economic strategy of the party was and is raising the efficiency of production and the quality of work, and a constant rise in all sectors of the national economy. A tested lever for multiplying labor successes and an efficient means of communist education of the people is socialist competition tied inseparably to the five-year plans. Soviet power workers are the foundation of the national economy, are always in the vanguard of communism, and always fight persistently to increase labor productivity, the efficiency of production and the quality of work. In this fourth year of the 10th Five-Year Plan period, collectives of enterprises and organizations of the power industry are continuing successfully the glorious traditions of the first flag-bearers of Lenin's electrification.

The collectives of the Reftinskaya and Kashirskaya GRES, construction brigades of M. P. Mashchenko from the Sayano-Shushenskaya GES and others have come forward with patriotic initiative in developing socialist competition in the industry.

At the beginning of the year, at a joint expanded meeting of the board of the USSR Ministry of Power and Electrification [Minenergo] and the Presidium

of the CC of the Trade Union of Workers of Electric Power Plants and Electric Equipment Industry, socialist obligations for 1979 of enterprises and organizations of the USSR Minenergo were approved.

In response to the directives of the 25th party congress, the November (1978) Plenum of the CC CPSU and the appeal of the CC CPSU to all electors and citizens of the USSR, and in striving to meet with honor the 60th anniversary of the first communist subbotnik, the power workers of the industry adopted the following obligations for 1979:

increase the efficiency of power enterprises and produce 1176.4 billion kw-hours of electric power and 845 gigacalories of heat for supplying the national economy and the everyday needs of the people within the limits of the established plan and the limits of consumption. It is planned to achieve this by the best utilization of power capacities, raising the reliability of their operation, dissemination of advanced methods of equipment operation and reducing the time of its assimilation;

reduce idle time of equipment under repairs by 0.9% compared to that specified in the plan which will make it possible to reduce the idle time of one conventional power unit by an average of 14.3 hours and will mean an additional total output of electric power for all repaired power units of 327 million kw-hours. This must be achieved by introducing new equipment, technology of repair, improving labor and management;

complete before 15 October all planned capital repairs of power equipment with high quality work, and winterizing electric power plants for operation during the cold weather to provide to the national economy with reliable and stable electric power and heat during the fall-winter period of 1979-1980;

raise by 2% in the current year the readiness coefficient for carrying an electric load by 500,000 and 800,000 kw which will increase the available capacity of electric power plants by more than 150,000 kw;

obtain a unit fuel consumption of not greater than 329 grams/(kw-hours) for distributed electric power, thus saving 1.9 million tons of conventional fuel compared to 1978. The bases for reducing unit fuel consumption will be the acceleration of assimilation of new capacities, efficient distribution of electric loads, wider use of advanced equipment operating methods and optimization of operating modes of electric power plants and networks;

free conditionally 8000 persons and use them on new equipment being put in operation. Measures should be implemented for this purpose in the industry to increase productivity and norzalization of labor;

reduce the time for assimilating the rated capacity, compared to the norm times, of the second power units of 1 million kw each of the Chernobyl'skaya and Kurskaya AES respectively by 30 days and 15 days. This will make it possible to produce a considerable amount of power above the tasks at these AES;

complete by 22 December 1979, the Day of the Power Worker, measures to reduce at the TES the spread between installed and available capacities which will make it possible to increase the total operating capacity considerably.

The fulfillment of the obligations of the power builders of the industry will make it possible to put in operation in 1979 over 14 million kw-hours of capacities of which over 2.6 million kw will be ahead of schedule. Among them will be units at the Kirishskaya, Novo-Sterlitamakskaya and other TETs, the Reftinskaya, Iriklinskaya and Surgutskaya GRES, Sayano-Shushenskaya and Ust'Ilimskaya GES, at AES, as well as new high-voltage 750 kv lines.

At the same time, power builders have obligated themselves to save additionally, above the established norms, 11,000 tons of metal, 29,000 tons of cement, 18,000 m^3 of lumber and to release with excellent and good evaluations of work quality no less than 80% of the industrial facilities, electric power transmission lines and substations, housing and building for social and cultural-personal service purposes. At the same time it is planned to do 25% of the planned construction-installation work by the brigade contract method.

In 1979 the level of normalizing the labor of the production-industrial personnel must be increased to 75% of which 92% is to be according to technically substantiated norms.

It is proposed to reduce by 2% the volume of manual work set in the plan and overfulfill the plan for increasing the productivity of construction work. The obligations of the builders span a great volume of work on putting power facilities in operation abroad also. Socialist obligations on scientific research, design and planning design work specify the following:

fulfill the annual plan for introducing new equipment by the Day of the Power Worker; increasing the number of inventions by no less than 5% compared to 1978; achieve an increase in economic efficiency due to the introduction in production of scientific investigations in the area of power by 0.2 rubles per one ruble of expenditure compared to 1978; that collectives of scientific research and planning design institutes give wide practical help to operating workers of the Kurskaya and Chernobyl'skaya AES, and the Reftinskaya and Zaporozhskaya GRES to obtain rated indicators respectively of the second nuclear power units, the 500 Mw unit and three 800 Mw units, and give help to the operation workers of the "Zapadnourkrainskaya-Albertish" 750 kv overhead line.

Workers of enterprises and construction sites will be assisted in introducing inventions and innovation proposals in production with an economic effect of 200 million rubles.

By introducing the achievements of scientific-technical progress and improving the arrangement and design solutions, it is planned to reduce in 1979 the cost of construction by 30 million rubles and labor, by 5 million man-days.

The obligations further involve the implementation of comprehensive plans for the social development of collectives. For this purpose, the following will be completed ahead of schedule: no less than 1.9 million m^2 of housing, kindergartens for 9230 children, a 700-bed hospital, a clinic for 1530 patients, pioneer camps, dispensaries and other social and personal service facilities.

In 1979 no less than 121,000 new workers were given courses in schools to increase their skills, and the skills of 400,000 workers and over 100,000 engineering-technical workers were increased.

Some 106 dining rooms, seating 17,480 people and 37 stores will be opened; 18 fruit and vegetable warehouses, 11 refrigeration facilities etc. will be built, and power enterprises and construction sites as well.

The comprehensive plan for improving labor safety and sanitary-health measures for 1976-1980 involving part of the plan for 1979 will be completed by the Day of the Power Worker.

Socialist obligations plan great help for agriculture including the completion ahead of schedule of 25,000 km of 0.38 to 20 kv lines for the power systems of the Nechernozem region of the RSFSR, and 300 km above the plan in a number of oblasts of the Russian Federation.

Design-estimating documentation for 1250 agricultural facilities of the Nechernozem region will be prepared ahead of schedule.

Work amounting to 385,000 rubles will be completed in kolkhozes and sovkhozes on repairs and organizational-technical aid will be given in operating electric networks and electric substations, as well as help amounting to 1.9 million rubles before the start of harvesting to operate electric installations at grain threshing floors, elevators and other agricultural facilities involved in harvesting.

To protect the environment, the obligations plan to repair and modernize ash trapping facilities of 80 boiler units of TES and do a number of other big jobs.

Comrade L. I. Brezhnev, general secretary of the CC CPSU and chairman of the Presidium of the USSR Supreme Soviet, at the meeting on 2 March 1979, with electors of the Baumanskiy election district of Moscow, stated that "The solution of economic problems facing us demands a creative approach, high responsibility and the strictest discipline in all links of the economy. This applies to the work of managers at all levels. This also applies to the direct participants in production. Let everyone who stands at the machine tool, works in the field or at the drawing board ask himself: did he do everything to work more productively, with better quality, save materials and not squander time idly?"

A worthy reply to these words is the fulfillment by each power worker and each power builder of the adopted socialist obligations by the Day of the Power Worker and the individual five-year plan tasks -- by the 110th anniversary of V. I. Lenin's birthday.

2291
CSO: 1822

LIST OF POWER PLANT OUTPUT CAPABILITIES

Moscow ENERGETIK in Russian No 5, 1979 inside front cover

[Text] Established power of the largest USSR electric power plants at the beginning of 1979 in 1000 kw.

Krasnoyarskaya GES	6000
Bratskaya GES	4500
Zaporozhskaya GRES	3600
Uglegorskaya GRES	3600
Ust'-Ilimskaya GES	3600
Krivorozhskaya GRES-2	3000
Reftinskaya GRES	2800
Volzhskaya GES imeni 22nd party congress	2541
Troitskaya GRES	2500
Burshtynskaya GRES	2400
Yermakovskaya GRES	2400
Zainskaya GRES	2400
Zmiyevskaya GRES	2400
Konakovskaya GRES	2400
Kostromskaya GRES	2400
Lukoml'skaya GRES	2400
Novocherkasskaya GRES	2400
Nurekskaya GES	2400
Pridneprovskaya GRES	2400
Syrdar'inskaya GRES	2400
Volzhskaya GES imeni V. I. Lenin	2300
Voroshilovgradskaya GRES	2300
Starobeshevskaya GRES	2300
Iriklinskaya GRES	2100
Slavyanskaya GRES	2100
Kirishskaya GRES	2070
Moldavskaya GRES	2020
Leningradskaya AES	2000
Chernobyl'skaya AES	2000
Kashirskaya GRES	2000
Tashkentskaya GRES	1945
Surgutskaya GRES	1914

Karmanovskaya GRES	1800
Ladyzhinskaya GRES	1800
Litovskaya GRES	1800
Tripol'skaya GRES	1800
Estonskaya GRES	1610
Verkhne-Tagil'skaya GRES	1575
Stavropol'skaya GRES	1500
Cherepetskaya GRES	1500
Kurakhovskaya GRES	1460
Novovoronezhskaya AES	1455
Pribaltiyskaya GRES	1435
Nevinnomysskaya GRES	1380
Saratovskaya GES	1360
Dneproges imeni V. I. Lenin	1312
Nazarovskaya GRES	1300
Tbilisskaya GRES	1250
TETs-22 Mosenergo	1250
Dzhambul'skaya GRES	1230
Belovskaya GRES	1200
Ryazanskaya GRES	1200
Toktogul'skaya GES	1200
Sredne-Ural'skaya GRES	1198
Irkutskaya TETs-10	1160
TETs-23 Mosenergo	1150
Krasnoyarskaya GRES-2	1140
Rozdanskaya GRES	1110
Ali-Bayram linskaya GRES	1100
TETs-21 Mosenergo	1100
Zeyskaya GES	1075
Shaturskaya GRES	1020
Krasnodarskaya TETs	1005
Krasnoyarskaya TETs	1005
Nizhne-Kamskaya TETs	1005
Votkinskaya GES	1000
Kurskaya AES	1000
Cherkeyskaya GES	1000
Yuzhno-Ural'skaya GRES	1000

2291
CSO: 1822

ELECTRIC POWER AND POWER EQUIPMENT

DEVELOPMENT OF POWER MACHINE BUILDING

Moscow EKONOMICHESKAYA GAZETA in Russian No 22, May 79 pp 1-2

[Editorial review]

[Text] Power machine building is one of the most rapidly developing sectors of our heavy industry. The ratio of equipment for nuclear electric power plants is increasing in the total output volume of the sector's enterprises in the 10th Five-Year Plan period.

The output of high power units for thermal electric power plants, as well as hydraulic and gas turbines is increasing. Power machine building enterprises equip underground pipelines with gas-pumping machinery; They supply forced-draft machines to blast furnace plants; belt conveyors and mills -- to mining-enriching combines; provide diesel engines for drill rigs and heavy trucks,and produce other modern equipment.

In 1976-1978, the volume of production at enterprises of the Ministry of Power Machine Building [Minenergomash], calculated on the basis of a net norm output, increased by 21.5 percent (this estimating indicator has been used in all power machine building since the second half of last year). During this period, tens of large hydraulic turbines were manufactured, including those for the Ust'-Ilimskaya, Zeyskaya, Sayano-Shushenskaya, and other GES, as well as hundreds of steam turbines. A special design 1.2 million kw power unit was made for the Kostromskaya GES. Equipment was supplied to Kurskaya, Chernobyl'skaya, Leningradskaya and other nuclear electric power plants.

The production capacities of the sector increased considerably last year. The first stage of the Volgodonskiy "Atommash" Plant for making a 3 million kw reactor was put in operation. The congratulations of Comrade L. I. Brezhnev on this occasion inspired participants in building the "Atommash" to new successes.

Increase in volume of production of Minenergomash enterprises [net output norm 1975 = 100 percent)

1975	100
1976	109.8
1977	116.4
1978	121.5
1979 (plan)	128.7

The production capacities of three such very large pipe-building combines as the Leningrad Metal Plant, the Turbine Motor Plant (Sverdlovsk) and the Khar'kov Turbine Plant have increased. Much has been done on the radical modernization of the Izhorsk PlantAssociation ahd the reequipment of a number of other enterprises.

Great problems are being solved by power machine builders in the fourth year of the five-year plan period. Production volume must be increased by 5.8 percent and labor productivity by 5 percent. The equipment output for nuclear electric power plants must increase by 18 percent, hydraulic turbines -- by 34 percent and gas turbines -- by 17 percent. The workers of the sector are being called upon to build complete sets of equipment for 45 thermal, 7 hydraulic and 7 nuclear electric power plants.

This year will be an important stage in the development of nuclear power. Equipment delivery will be completed for the million kw unit No 5 of the Novovoronezhskaya AES. This is the first water-cooled, water-moderated "million kw" reactor with a two-loop arrangement in the country. At the Beloyarskaya AES,it is planned to start up a 600,000 kw power unit with a fast neutron reactor. Similar reactors with such capacities have not been manufactured by our plants before. The 25th party congress directives posed the organization of series production of such reactors as one of the most important problems of power machine builders.

Taking into account the start-up of new power units at the Kurskaya, Armyanskaya and Rovenskaya AES, the installed capacity of AES will increase by almost 5 million kw.

Increase of labor productivity at Minenergomash enterprises

(1975 = 100 percent)

1975	100
1976	107.3
1977	110.9
1978	114.5
1979 (plan)	120.2

The task on product sales in the sector in four months of this year was fulfilled by 100.8 percent. Socialist competition for fulfilling the annual plan over the entire range of equipment developed widely in the enterprises.

A large amount of work was done on exposing and mobilizing reserves for raising production, and the quality of the work by the collectives of the Sverdlovsk Turbine Motor Plant Combine, the Barnaul Boiler Plant and the K_sinskiy Machine Building Plant which were awarded the Rotating Banner of the CC CPSU, USSR Council of Ministers, the VTsSPS and the CC VLKSM on the basis of the results of last year. The initiative of the Rostov workers is being disseminated in the sector, including that of the Taganrog "Krasnyy Kotel'shchik" workers -- "Work without laggards."

However, an analysis of the work of the Minenergomash for 4 months indicates that available internal reserves are still not being fully utilized and that there are serious shortcomings in the operational activity of individual plants. Thus, the Syzran'Turbine Building Plant did not fulfill the plan for 4 months on product sales. It did not cope with the tasks of delivering mills, crushers and cast iron castings. This is due, primarily, to omissions in the organization of production,poor monitoring of orders of plant services and insufficient demands upon the part of the ministry on the managers of the enterprises. Since the beginning of the year, the Khar'kov Turbine Plant Association produced 630,000 rubles worth of fewer products than planned.

A number of enterprises in the sector are not fulfilling the plan on basic equipment. In the first quarter, the Podol'sk Machine Building Plant delayed the shipment of steam generators to the Beloyarskaya AES. The Khabarovsk Plant of Power Machine Building did not deliver the planned quantity of gas turbines, pumps, compressors and spare parts. The Belgorod Power Equipment Plant owes construction sites several boilers, station and turbine pipelines and welded structural metal. The Izhorsk Plant Association has a shortfall of steel castings, rolled stock and chemical equipment. As a result, the ministry did not fulfill the plan for the first quarter on 19 basic kinds of equipment. High priority construction sites did not receive 400 equipment units, 900 units of accessories and over 1000 tons of special pipeline on time.

Of course, the work of the enterprises which fell behind in the first quarter was complicated by unfavorable weather and an irregular supply of metal and other materials. However, even under such conditions, many other associations and plants were able to cope with the plan successfully. Disruptions and delays are permitted where plan discipline is violated and production is not well organized.

Along All Directions of Technical Progress

One of the basic directions of short-range and long-range scientific-technical progress in power engineering is the further expansion of building nuclear electric power plants.

Since putting in operation the first AES in the world in the Soviet Union in 1954, a great amount of experience has been accumulated in creating nuclear

reactors and other equipment, and production of all kinds of metals and other materials for nuclear machine building was organized. Nuclear power engineering is being developed fully on a domestic basis. Unit capacities of equipment are being increased constantly with simultaneous improvement in its technical characteristics.

At present, scientific research institutes, planning-design organizations and power machine building enterprises are doing a great deal of work on developing documentation and preparing production equipment for a 1.5 million kw power unit with a boiling water-graphite channel reactor.

On the basis of the VVER-1000 reactor, installations documentation was developed for a nuclear TETs (ATETs) and equipment is being designed for a nuclear heat supply plant (AST). The solution of the thermif'cat.on problem for cities using nuclear power will make it possible to reduce the consumption of coal, petroleum and gas.

A considerable part of the design and technological forces of the sector are now involved in the development of a high speed 1 million kw steam turbine for the AES. It is estimated that the economic effect of using such units will exceed 7 million rubles per year.

Increase in output of highest category of quality

(in percentage of total volume of production in the sector)

1975	12
1976	13
1977	16
1978	22
1979 (plan)	25

The organization of the production of new gas turbine power machines is being continued. By the beginning of this year, the Leningrad Metal Plant Association had manufactured six gas turbine machines with a unit capacity of 100,000 kw of which two operate at one of the plants of the Hungarian People's Republic. The Nevskiy Plant Association began testing a prototype of an automated 25,000 kw unit machine for gas-pumping stations of underground main pipelines, while on test stands of the Turbine-Motor Plant Association, debugging of a 16,000 kv unit was completed. They will replace 6,000 and 10,000 kw machines in series production.

Improve Quality of Machines

Changing over to the production of new kinds of equipment demands that power machine builders solve complicated technical and economic problems. In recent years, scientists and specialists of industrial scientific research institutes and enterprises developed a series of new materials with improved operational and technological properties.

The constant creative search and systematic introduction of advanced experience facilitate the undeviating growth of the technical standards of manufactured products. The newest power equipment are basically at the level of the best achievements of foreign equipment in its technical-economic indicators. However, technical progress in power machine building must be accelerated. The design, construction and testing of prototypes are sometimes delayed. Thus, in order to burn high-ash Kansko-Achinskiy coal, it is planned to modernize one of the boiler units of the existing Nazarovskaya GRES. In February, 1977, a special order was issued on this matter by the Minenergomash. The completion date lapsed last year, but the workers of the Podol'sk Machine Building Plant still have not furnished the new euqipment for the boiler unit which, to a considerable degree, is the fault of the Nazarovsk power workers.

A serious miscalculation in creating the type GTN-16 gas-turbine unit was made by specialists of the Turbine-Motor Plant Association and the Central Boiler-Turbine Institute (Leningrad). As a result, the machines produced could not attain the rated power. Changes which necessitated extra expenditures of money were required and time.

Sufficient experience has been accumulated in power machine building to avoid such cases. The following indicators show higher standards of products while in 1975, the ratio of products with the government emblem of quality was 12 percent, by the start of the current year, it increased to 22.4 percent. The honorable pentagon was awarded to 275 kinds of assemblies, machines and devices. In 4 months this year, 20 more products were certified for the highest category of quality.

Last year over 1000 organizational-technical measures were taken to improve product design, technological processes and monitoring methods. A comprehensive quality control system was introduced at 12 enterprises.

Yet individual indicators of certain types of manufactured equipment are inferior to the best modern models. Many failures in the operation of power units are due to malfunctions of forced-draft equipment, dust preparation, regenerative heaters of feed water, accessories and other equipment, It is necessary to increase considerably the life of the diesel engines made by the Turbine-Motor Plant Association and reduce the weight of mills made by the Syzran' Turbine Building Plant. Standardization of power machine building products is still being implemented too slowly.

The successful solution of problems faced by the sector depends, to a great extent, on raising the level of scientific research and experimental-design work, and the development of an experimental base. The ministry is called upon to strengthen the design subdivisions at the Chekhovskiy and Khabarovskiy plants and the Dorogobuzhskiy Boiler Plant. The experimental bases of hydraulic turbine building are still weak at the following associations: the Leningrad Metal Plant, the Khar'kov Turbine Plant and the "Krasnyy Kotel'shchik"(Taganrog).

The government is allotting considerable amounts of money for building new enterprises and reequipping existing ones of the Minenergomash. In 1978 alone, capital investments exceeded 500 million rubles.

Yet the building of new forging-pressing shop at the Izhorskiy Plant Association is being delayed by Trust No 35 of the USSR Minstroy [Ministry of Construction], as well as the facilities of the branch of the "Nevskiy Zavod" Association at Chudovo by the "Mashstroy" Trust of the same Ministry. Here it is important to utilize advanced experience so that high priority facilities are completed ahead of schedule by the joint efforts of collectives of builders and production people. Thus, the main building at the Monastyrishchenskiy Machine Building Plant, the test stand-assembly shop on the main site of the "Nevskiy Zavod " Association and others were put in operation ahead of schedule.

In 1979, plant collectives, jointly with builders, obligated themselves to put in operation ahead of schedule new capacities at the "Atommash" Plant for producing 1 million kw of power equipment for the AES and to release for operation a 15,000-ton special design press at the Kramatorskiy Plant of Castings and Forgings. At the end of 4 months, the results indicate that the work at these construction sites is proceeding successfully. Yet the remaining volume of work is such that its completion will require the maximum mobilization of forces and energy of all participants in the construction, and clear-cut organization of the work of each subdivision.

The power machine builders are competing for completing the annual plan ahead of schedule; an additional output of two steam turbines 500,000 and 300,000 kw each; 25 steam boilers; 20 turbine compressors; 20 diesels; and implementing the tasks on all the basic equipment list. It was decided to overfulfill the task for 1979 on raising the productivity of labor and to complete the 4 year goals of the five-year plan period in accordance with the given indicators by 10 December 1979.

2291
CSO: 1822

UDC 621,311.22.001.86

EXPERIENCE OF ASSIMILATION OF ZAPOROZHSKAYA GRES

Moscow ELEKTRICHESKIYE STANTSII in Russian No 4, Apr 79 pp 2-6

[Article by L. V. Prokhorov, director of the Zaporozhskaya GRES]

[Text] The Zaporozhskaya GRES is the first 3,600,000 kw series built thermal electric power plant whose construction was specified by the 25th party congress directives. The first stage,consisting of four power units of 300,000 kw each,was designed for burning Donetsk coals (rated unit fuel consumption 345 grams/(kw-hour)), while the second stage, consisting of three 800,000 kw units, was designed to operate on fuel oil (rated unit power consumption 325 grams/(kw-hour).

The Zaporozhskaya GRES was built by the accelerated flow line method, taking into account the experience of building the Burshtynskaya and Ladyzhinskaya GRES. In the process of construction, special attention was given to increasing the number of prefabricated parts and structures of the building; the clear-cut organization of construction work and the installation of the technological equipment; using dispatcher control and mechanizing this work as well as insuring the delivery of the technological equipment by the plants on schedule to complete installation work.

All this made it possible to reduce construction time compared to norms: the first stage -- by 15 months and second stage -- by 3 months, as a result of which, over 12 billion kw-hours of additional electric power were produced and an economic effect of about 26 million rubles was obtained. Labor expenditures per one kw-hour were 2.01 mand-days -- the best result in building thermal electric power plants in the USSR.

The Zaporozhskaya GRES was completed in September 1977 when the third and last 800,000 kw power unit was put in operation.

Assimilation of equipment in the first stage. The 300,000 kw power unit consists of the TPR-312A boiler unit built by the Taganrog "Krasnyy Kotel'shchik" Plant, the K-300-240-2 turbine built by the Khar'kov Turbine Plant imeni S. M. Kirov, the TGV-300 generator built by the Khar'kov "Elektrotyazhmash" Plant imeni V. I. Lenin and a 400 Mva transformer built by the "Zaporozhtransformator" Production Association.

The turbine, generator and transformer are series manufactured equipment which have been sufficiently assimilated at other electric power plants of the USSR. The TPP-312A boiler unit is a prototype of power equipment; therefore, its assimilation presented a number of difficulties.

TPP-312A boilers were designed for burning Donetsk gas coals with the fuel being air dried and the coal dust being transported by the discharge air of the mill blowers. However, the operating experience of the previously manufactured TPP-312 boilers at the Ladyzhinskaya GRES indicated a higher danger of explosion in this arrangement of preparing coal dust.

Taking this into account before starting up the first power unit, there was built a feed of hot inert gases by the pressure of exhaust fans for recirculating gases to the mills. A large amount of work was also done on detecting and eliminating possible places for dust to settle. The dust lines outside the boiler building were insulated along the route of the dust systems. The measures enumerated above made it possible to increase considerably the safety from explosion of the dust preparation equipment.

During the first period of operation no considerable defects in the design of the boiler itself, as well as of any of its auxiliary equipment were found which could lead to a reduction in reliability or limitation of power. This made it possible, immediately after changing over the boiler to burn dust, to operate on a load near the nominal for a long time.

At the same time, individual bottlenecks detected in the initial period of operating boilers at the Zaporozhskaya GRES should be noted. At first, the greatest difficulties originated due to the low quality of fuel with sharply variable qualitative characteristics which the GRES received.

Later the quality of fuel improved considerably which reflected favorably on the operation of the boiler. The number of cases when the load had to be restricted due to a lack of dust as a result of the restriction in the efficient drying of the dust systems dropped and the reliability of the boiler unit operation increased.

To increase the efficient drying of the dust systems, additional packing of the RVP [Pneumatic timing relay] central zone was installed, dust pipelines operated by the discharge pressure of mill blowers to the boiler furnace were provided, and the diameter of the line for adding hot inert gases was increased. The indicated modernization as well as the insulation of the ducts and cyclone dust separators increased the temperature of the drying agent ahead of the mills to 345-350°C and removed limitations on the efficient drying of the dust systems for a working humidity of the fuel of up to 15-16%.

Type VM 180/1100 mill blowers were installed in the dust systems of the blowers. The vanes of their working wheels wore out after 500 to 600 hours of operation. Repairs of the wheels of the mill blowers required considerable labor expenditures and reduced the efficiency of the power unit since, with the dust system, its load could not exceed 200 Mw.

The wheels of the mill blowers were rebuilt according to the design of the Ural enterprise, Soyuztekhenergo. As a result, the run of the mill blower increased 2.5 to 3 times, the pressure head decreased by 200 kg-force/m^2 and productivity remained the same.

In the first period of operation, great difficulties originated with the removal of liquid slag. After the adjustment of the firing mode that insured a stable flow of liquid slag, and after replacing rotary conveyors with worm conveyors with a twin worm, there was reliable removal of liquid slag.

It should be noted that the TPP-312A have a greater area of the intermediate steam-superheater even after it was reduced by 30% in the process of installation. The changeover of the boiler dust systems to drying the fuel by smokestack gases led to an increase in the heat absorption of the low pressure convective steam-superheater (KPP) and, at present, an emergency injection is connected at all operating modes of the boiler in the load range of 80 to 100% of the nominal. To reduce it, the electric power plant, jointly with the TKZ [Taganrog Boiler Plant], increased the surface of the suspension system of the convection column which, along with reducing the injection by 40 to 50%, also reduced the temperature of the exhaust gases.

Considerable attention was given to selecting the optimal air mode of the boiler. Optimal velocities of the primary and secondary air in the burners, and the optimal oxygen content at the boiler and dust system outlets were selected. A thorough adjustment of the air mode made it possible to increase the efficiency of the boiler unit and dust system operation, improve the liquid slag exit, and reduce slagging of the firebox, screens and the high pressure KPP [expansion unknown].

The installation on the TPP-312A boilers of exhaust fans for recirculating gases and supplying gases to the upper part of the firebox reduced considerably but did not eliminate slagging of the rotary gas conduit and of the high pressure KPP. At present, this steam-superheater is equipped with)G-62 blowers which use as a working medium 39 to 40 kg-force/cm^2 steam at 290 to 300°C. This made it possible, by periodic blow-outs, to reduce considerably the slagging of high pressure KPP, and reduce the time that the power unit must operate with restricted loads,and the number of its stoppages for cleaning out the slag.

The telescopic OG-8 devices installed on the boiler for cleaning screens are inefficient, therefore, in 1975-1977, a "cannon" blow-out was installed on the boilers and was found to be an efficient way to fight the slagging of screens and high pressure KPP.

At the end of 1975, high temperature gas corrosion was detected on the NRCH [expansion unknown] shields of the TPP-312A boilers due to the use of high-calorie gas concentrates (Q^P_H = 6000 kcal/kg) and the unsatisfactory organization of burning them under conditions of a small number of operating dust-feeders and, as a result, the nonuniform distribution of dust among the burners.

Because of the implementation of a complex of organizational-technical measures, TPP-312A boilers have had no stoppages since the third quarter of 1977 due to the NRCH pipe being damaged by gas corrosion. Among these measures were: mixing high and low calorie fuels at the warehouse; providing idle discharges of the drying agent by the pressure of the mill blowers into the central channel of the burners; detection of defective pipes during each stop; cutting out the registers (every other one) of secondary air for reducing the flame falling on the walls of the firebox; uniform distribution of air among burners; revising the dust feeders and readjusting them, etc.

In view of the urgency of the indicated problem, the collective of the Zaporozhskaya GRES is continuing work on reducing gas corrosion of the NRCH pipes which involves scientific research and adjusting organizations. As a result, at present, the speed of this corrosion is reduced from 4-5 to 0.6-1 mm per year.

The basic bottlenecks in the operation of the 300 Mw turbine unit were the unreliable work of the vanes of the TsND [Low pressure cylinder], the poor reliability of the pipe system and the membrane connectors of the PVD [High pressure heater]. After introducing the recommendations of the plant on increasing the reliability of the TsND vane operation, the electric power plant has had no breakage of vanes since December 1975.

PVD coils began getting out of order intensively after 3.5 years of operation due to erosion caused by the high speeds in the pipe system. The replacement of the entry parts of the coils by austenite inserts, according to the experience of the Ladyzhinskaya GRES, and scrapping the worn coils made it possible to reduce the number of breaks in the pipe systems and reduce fuel overconsumption due to the lowered temperature of the feed water.

To increase reliability of operation of the membrane connectors of PVD, the electric power plant introduced a number of measures which reduced the number of times the PVD were disconnected to eliminate air holes in the membrane. However, so far it has been impossible to eliminate the damage fully and work is continuing in that direction.

Great importance is attached to raising the efficiency of the turbine unit. A considerable number of measures have been introduced to reach the norm temperature pressures in high and low pressure heaters and to tighten the seal of the drainage equipment.

The arrangement for heating steam pipes from the regulating valves of the TsVD [High pressure cylinder] was changed. In order to reduce losses of water and steam, a cooler for dirty condensate was installed which made it possible to put an independent desalinating equipment in operation, and reduce condensate losses by 0.2%.

Serious attention is being given to the operation of the condenser equipment. To maintain a temperature pressure in the condenser near that of the norm,

a complex of measures was implemented on increasing air suction to meet the PTE [Technical operation rules] norms, and the set-up for cleaning balls. When the power units are stopped, the condenser pipes are cleaned mechanically.

All the measures enumerated, as well as measures for improving the reliability of the basic and auxiliary equipment and raising the standard of operation, make it possible to constantly improve the technical economic indicators of the 300 Mw power units (Table 1).

It should be noted that in recent years the rate of reducing unit fuel consumption has slowed down which is due to the exhaustion of the basic reserves for raising the efficiency, as well as the aging of the equipment and the use of the 300 Mw power units in the regulation mode. However, reserves are still available for reducing unit fuel consumption and every year the electric power plant introduces a considerable number of measures for a still greater increase in the efficiency and reliability of the 300 Mw power units.

Assimilation of equipment of the second stage. After the successful assimilation of the first stage of the GRES, a more important problem was posed before the collective of the electric power plant: put into operation and assimilate 800 Mw power units. Practically all the equipment of these power units was prototype equipment and required debugging.

The greatest difficulties were encountered in assimilating the special design TGMP-204 gas-tight, single-housing boiler unit with a steam productivity of 2650 tons/hour. The very first period of operation indicated that the boiler unit designed for operating under pressure feed was not gas-tight. The arrangement for connecting the VRCh [expansion unknown], the suspensions of the rotary gas conduit and the burner duct was unsuccessful and led to the damaging of the VRCh panels when starting up from a hot condition, destroying the gas tightness of the boiler. The vibrations of the gas flow in the convection column and the poor design of the burner compensators also destroyed the gas tightness and prevented the changing over to the operation of the boiler unit under pressure.

The most important shortcomings in the work of the K-800-240-3 turbine unit during the first period of operation were the unreliable work of the high rotation speed shaft; periodic appearance of low-frequency vibration at loads near the nominal; too high temperature of the thrust bearing; deformation of the collar beam under the supports of bearings No 1 and 2; wedging of keys and, as a result, intermittent expansions of the TsSO [Medium pressure cylinder] in the starting modes.

Of the shortcomings of the auxiliary equipment it is necessary to note the poor reliability of the vanes of the OPZ-185EG circulation pumps; the high vibration of the recirculation exhaust pumps and the poor reliability of their motors; the unreliability of oil supply arrangements of turbine air blowers (TVD); and the high vibration of the feed turbine pump and the TVD.

The nominal loading of the 800 Mw power unit (station No 5) was reached in April 1976 (3 months after being put in operation). However, the carrying of the nominal load was impossible for a long time due basically to poor gas tightness of the boiler.

Loading the power unit with the boiler operating in modes with "balanced" traction was limited to 620-640 Mw due to the insufficient rated power of standby exhaust fans not designed for the power unit carrying the nominal load in such a mode.

To eliminate the shortcomings and defects, the electric power plant in conjunction with adjusting organizations and manufacturing plants developed measures for increasing the efficiency and reliability of the 800 Mw power units which were included in the joint decisions of four ministries. In spite of the difficulty in supplying equipment and spare parts, the basic part of the measures was introduced in power unit No 5 in the middle repairs (October 1976) which made it possible for it to carry a nominal load stably.

The basic part of the measures was introduced in power units Nos 6 and 7 during installation which made possible a sharp reduction in the assimilation time of the rated capacity of these power units. Thus, while power unit No 5 carried a nominal load stably 10 months after being put in operation (for a norm of 18 months), this period for power unit No 6 was reduced to 1 month and for power unit No 7 -- to two weeks.

Due to the painstaking and persistent work of the collective in removing the shortcomings in the operation of the equipment, carrying out a complex of adjusting-research work, introducing measures according to the directives of four ministries, raising the standard of operation and utilizing the experience of related enterprises, the technical-economic indicators of the 800 Mw power units at the Zaporozhskaya GRES are improving. Thus, already in the second year of operation (for a norm of 3 years), power unit No 5 reached the rated unit fuel consumption. In 1978 this indicator was obtained on the second stage.

The mode-adjusting measures being introduced systematically by the adjustment and test shop are of great importance in increasing the efficiency of the equipment. These measures include: efficient control of the air mode, maintenance of the optimal surpluses of air; better sealing of the gas channel, reducing suctions in the regenerative air-heater, the use of stationary ventilation of RVP for reducing heat losses with the exhaust gases; constant elimination of air infiltration into the vacuum systems of the condensers to raise the efficiency of the steam turbine unit, improving the thermal arrangement of the power unit and the electric power plant; regular monitoring of the temperature pressures of high and low pressure heaters; systematic monitoring, constant development and introduction of measures to reduce losses of steam and condensate.

Table 1

300 Mw power unit indicators	Rated	Actual by years					
		1973	1974	1975	1976	1977	1978
Electric power output, million kw-hours	7200	6261	7974	8396	8642	8555	8863
Readiness coefficient, %	-	84.95	86.89	88.11	87.74	88.23	88.06
Average load, Mw	240	240	264	273	280	277	273
Unit consumption of conventional fuel, grams/(kw-hour)	345.0	368.5	347.9	341.0	339.7	338.5	338.0
Electric power used for own needs, %	5.6	6.33	5.49	5.54	5.68	5.6	5.60
Unit (per 1000 hours) number of stops	-	4.57	1.86	1.43	1.78	1.36	1.31
Including forced stops	-	2.65	0.70	0.42	1.14	0.65	0.46

Table 2

800 Mw unit indicators	Rated	Actual by years		
		1976	1977	1978
Electric power output, million kw-hours	15,120	4319	9607	15,365
Readiness coefficient,%	-	63.62	75.10	83.28
Average load, Mw	640	618	657	713
Unit fuel consumption, grams/(kw-hour)	325.0	340.13	328.56	323.55
Electric power consumed for own needs, %	2.15	3.46	2.71	2.22
Unit (per 1000 hours) number of stops	-	8.58	3.08	1.86
Including forced stops	-	6.72	1.57	0.79

It should be noted that the assimilation of the 800 Mw power units was delayed considerably by design and manufacturing defects in the rings that regulate the TsVD steps. This was discovered during the middle repairs of power units Nos 5 and 6. The shortcomings were eliminated in power unit No 7 during installation.

In spite of certain successes in raising the reliability and efficiency of the 800 Mw power units, a number of problems still remain unsolved. Among them are the intensive corrosion of the RVP packing and gas lines, unreliable design of the spacer plates of steam superheaters, reduction in the efficiency of the power unit at loads lower than 500 Mw due to the throttling steam distribution of the turbine, and the unreliable work of the membrane connectors of the PVD.

At present, the electric power plant in conjunction with the manufacturing plants and scientific research organizations are persistently working to solve these problems.

As a whole, the assimilation of the 300 Mw and 800 Mw power units may be considered successful. The accelerated putting in operation and the rapid assimilation of the equipment of both stages were facilitated greatly by the following complex of technical and organizational solutions: organization of the monitoring of the quality of the equipment in the process of production at the manufacturing plants; wide participation of repair and operational personnel in preinstallation revisions of equipment and in debugging installation and construction work; careful study of the experience in operating similar electric power plants, in particular, the Burshtynskaya, Ladyzhinskaya and Kostromskaya GRES; analyze the design in detail before starting

installation and introduce the necessary changes in the design documentation; do the basic rebuilding work on equipment and technological arrangements before power units are put in operation; build up operational personnel with cadres experienced in working on similar equipment; thorough education and training of personnel; broad attraction of adjustment and scientific research organizations to the work.

Since the beginning of GRES construction, much attention has been given to socialist competition. The conditions and forms of competition were developed and introduced. There is intraplant competition between three groups of shops. The results are totaled monthly. The competition is publicized widely and victors are awarded materially and spiritually.

Year after year the electric power plant fulfills successfully the adopted socialist obligations. Its collective has won prizes many times in the Ukrainian SSR and the USSR Minenergo [Ministry of Power and Electrification]. According to the results of the work for the second quarter of 1978, the Zaporozhskaya GRES was proclaimed the winner in the all-union socialist competition and awarded the Rotating Red Banner of the USSR Minenergo and the CC of the Trade Union of Electric Power Plant and Electric Equipment Industry. In the third quarter of last year, the electric power plant was awarded a class two place.

Of great help in improving the electric power plant work indicators is the socialist competition between the collective of the Zaporozhskaya GRES and the collectives of the Ladyzhinskaya and Uglegorskaya GRES. Regular exchange of experience helps to overcome difficulties arising in the process of operation and assimilation of the power units.

Innovators and inventors played a large role in the assimilation of the power units. Since the start of GRES construction they proposed over 6300 innovations with an economic effect of over 4.8 million rubles.

Thus, close and constant cooperation among specialists and workers, Communists and nonparty people makes it possible to solve successfully problems of assimilating equipment posed before the electric power plant, makes it possible to improve the technology of power production further, improve the technical-economic indicators constantly and raise the productivity of labor and the standards of production.

2291
CSO: 1822

EXHIBITION ON SAVING FUEL-POWER RESOURCES

Moscow ENERGETIK in Russian No 5, 1979 pp 38-39

[Article by N. N. Belozerova, main methodologist of the Machine Building Pavilion and I. A. Sergeyeva, candidate of economic sciences: "From the Exhibition' Experience of Work of the Party Organization of Kemerovskaya Oblast on Saving Fuel-Power Resources"]

[Text] Having achieved considerable successes in developing the fuel-power complex of the country, Soviet workers are concerned about the efficient consumption of fuel and energy. Comrade L. I. Brezhnev, general secretary of the CC CPSU, stressed at the 25th party congress that no matter how rich our society grew, the strictest economy and thrift remain the most important conditions for the development of the national economy, and for improving the welfare of the people.

At the USSR VDNKh, the Machine Building Pavilion, there is an exhibit on the theme, "Experience of Work of the Party Organizations of Kemerovskaya Oblast on Saving Fuel-Power Resources."

Since the start of the five-year plan period, enterprises and other organizations in the oblast saved a considerable amount of fuel, electric power and heat energy above the norms and planned tasks. An important feature of this work is its mass nature, the purposeful carrying out of political and organizational-technical measures according to a developed comprehensive plan.

The basic directions for saving fuel-power resources and using them efficiently are: raising the standard of operation of the whole power industry and of the operating equipment; developing and introducing progressive technological processes and arrangements, new machines that provide a high technical standard of production at minimum expenditures of fuel-power resources; reducing fuel losses in mining, reprocessing, transporting and storing it; utilizing secondary power resources; improving the normalizing, accounting and monitoring of the consumption of fuel and power resources; improving the forms and methods of organization of socialist competition.

The patriotic movement for thrift is headed by the party organizations of the oblast. The forms and methods of the work of the party organizations

for mobilizing the workers to fight to save fuel and power are different. Thus, great attention is being given to review competitions which made it possible to save over 544 million kw-hours of electric power and over 317,000 tons of fuel in the oblast. The oblast Soviet and 44 city and rayon Soviets are active in the oblast in coordinating the activities directed toward saving power resources.

In all sectors of the national economy of the Kemerovskaya Oblast, much attention is being given to the problem of saving fuel and power resources.

The Order of Red Banner Kuzbass power system combines eight electric power plants, four electric network enterprises and one heat network enterprise.

Due to the introduction of organizational-technical measures and a reduction in electric power and heat consumption for its own needs, the power system saved, in the 3 years of the 10th Five-Year Plan period, 760,000 tons of conventional fuel (1 million tons of coal) and 40.3 million kw-hours of electric power.

The exhibition gives information on the automated system for controlling the Kuzbass power system which controls efficiently the process of production, distribution and the sale of electric power by means of a computer which gathers and transmits data. The system solved 79 engineering and production problems by using a computer and three sets of calculating-data machines which made it possible to save 6 million kw-hours of electric power. The introduction of the ASU [Automated control system] in the Kuzbass power system saved 116,000 rubles. The Kuzbassenergo REU [expansion unknown] developed and manufactured the system.

Among the models at the exhibit there should be noted a device for protecting and monitoring the insulation of the generator unit stator designed to protect against short-circuiting the generator stator winding to the housing, and monitoring the insulation resistance of the stator winding circuit at the working voltage. Electric isolation of secondary circuits, accessible to the personnel, is a departure from the well-known devices in the circuit. The device is very sensitive to short-circuits through transit resistances. Its dimensions are 600x800x150 mm and it weighs 10 kg. It saves 3500 rubles annually. It was developed and manufactured by the Kuzbassenergo REU.

Another exhibit is a meter for measuring the vertical dimensions of the type IVGL VL (Overhead line) designed for measuring vertical distances to VL conductors at working voltages of up to 110 kv. The meter consists of nine telescopically connected tubes, a measuring cord and a counter. It is simple in design and makes it possible to do measurements without disconnecting the VL. It saves 2000 rubles a year. It was developed and manufactured by the Kuzbassenergo REU.

In 1978, a device for checking high frequency terminating suppressors and filters (UPZFP) was introduced in the Kuzbassenergo. It is designed to measure the frequency characteristics of the impedances and resistances of

tuning elements of high frequency suppressors of 0.25, 0.6 and 1.2 millihenries using equivalent inductances of high frequency suppressor reactors under laboratory conditions.

The device may be utilized with open distribution devices of electric power plants and substations and makes it possible to obtain the frequency characteristics of the input impedance and the attenuation of the terminating filters.

Great attention in the work of the party organization in the oblast was given to introducing new equipment and modernizing the old equipment. Thus, the collective of the Yuzhno-Kuzbass GRES modernized their equipment increasing the power plant capacity from 500 to 540 Mw. In 1976-1978 a number of measures was implemented which made it possible to save a considerable amount of fuel and power. The modernization of the flow-through part of the VK-100-5 turbine by organizing a thermification take-off will make it possible to save 10,000 tons of conventional fuel per year. Replacing condenser tubes of turbines with new tubes made of the MNZh-5 copper-nickel alloy and other measures saved 500 tons of conventional fuel annually. The installation of idle discharge lines on six duct systems of the second stage and enclosed raw coal feeders will save 700,000 kw-hours of electric power per year.

An arrangement of automating a bifilar water feed to the boiler is shown. The use of a reserve line for feeding water to the boiler makes it possible to reduce considerably the resistance of the feed line and reduce the feed line pressure by 5 to 7 kg-force/cm^2. Moreover, the necessary quality and speed of the maintenance of the level in the boiler drum are obtained at all modes of operation and 6 million kw-hours of electric power are saved. The power of the device is 700 kw, the voltage is 220 v and its dimensions are 100x1500x300 mm. The Yuzhno-Kuzbasskaya GRES developed and manufactured it.

The Belovskaya GRES is one of the largest in the Kuzbass. A characteristic feature of this GRES is its standard of production. This is due to high productivity and technological discipline, the scope of socialist competition and the activities of the workers and engineers. The initiative of the labor collective is the slogan "In the 10th Five-Year Plan period -- the least consumption of conventional fuel on 200 Mw power units." In the first 1.5 years of the 10th Five-Year Plan period, the plant saved 20,000 tons of conventional fuel and the indicator important for power enterprises is that fuel consumption for producing electric power was considerably lower than the norm indicator for the ministry. Unit fuel consumption was 337 grams/(kw-hour).

The initiative of the Belovskaya GRES in organizing competition for a thrifty attitude toward fuel and power resources is implemented in close cooperation with manufacturing plants and design and scientific research organizations. This made the elimination of some bottlenecks possible, provided reliability and efficiency of electric power plants and reduced by 4 to 6 times the number of forced stops of the power units.

The exhibit has a number of models of technical innovations which were developed and introduced at the Belovskaya GRES. Among them -- an automatic valve designed to reduce the basic condensate bypassing the regeneration system of the low pressure steam turbines. Its area of application -- feed electric pumps (PEN) with stuffing box seals. The condensate is fed to the stuffing box when the PEN is connected; when the PEN stops, the feed of the condensate to the stuffing box ceases. Fluoroplastic valve seats insure tightness against even scale and small cavities.

The basic technical data is: height -- 200 mm, diameter -- 110 mm, weight -- 5 to 6 kg, condensate consumption -- 6.6 m^3/hour. Introducing the valve saved 2200 tons of conventional fuel per year.

Among power enterprises of the Kuzbass which achieved especially good results in the fight to save fuel and power resources is also the Tom'-Usinskaya GRES. In the 10th Five-Year Plan period, nine shops, 57 brigades and 18 shifts work in this collective on collective accounts, and 352 people -- on individual accounts. In 2 years of the 10th Five-Year Plan period, 672 proposals were developed and introduced in production, saving 468,300 rubles, 8,088,000 kw-hours of electric power and 8100 tons of fuel.

The exhibition shows the work of the collective on increasing the quality of equipment repair for a maximum reduction in the time of repair.

A system of guaranteed certificates is introduced in the GRES for repaired equipment. It is especially important since this made it possible to open up new sources of socialist competition in the collective. Having a guarantee of equipment in excellent condition, the collective operates with greater assurance and more regularly.

Saving electric power in the Belovskaya city electric network has a prominent place at the exhibition. In 1974-1978, the city electric network, by bringing the power sources closer to the consumer, saved 160,000 kw-hours; 1,542,000 kw-hours were saved by replacing smaller cross section conductors with larger cross section conductors; 280,000 kw-hours were saved by changing the network voltage from 6 kv to 10 kv. The total saving was 1,982,000 kw-hours.

There is a mock-up of a rayon heating boiler with a covered coal warehouse at the exhibition. Putting in operation a boiler with a productivity of 36 gigacalories/hour replaced six low-capacity boilers. The coal warehouse is provided with RR access tracks, an unloading platform and is equipped with an overhead 5-ton grab-bucket crane. The capacity of the warehouse is 10 tons [?] and its dimensions are 90x36x15 m. Having a warehouse made it possible to reduce fuel losses due to oxidation, disintegration, erosion and freezing, and to mechanize laborious processes. The total saving was 700 tons per year. It was developed by the Santekhproyekt Institute and manufactured by the Belovskaya City Electric Network.

Since starting up the boiler facility in 1974, unit fuel consumption for producing 1 gigacalorie of heat was reduced from 211 to 183 kg. This was achieved by installing canvas hoods on the mainline network, insulating pipelines, installing a type 214 10-ohm regulator between the forward and reverse networks which made it possible to equalize the pressure before and after the network heater units from 35-40 to 5-10 m of the water column.

The exhibition shows the contributions made by innovators to saving fuel and power resources in the Belovskaya city electric network.

Supplying the city with hot water over a single-pipe system made it possible to save 54,720 kw-hours of electric power per year.

The use of the pressure regulator in the thermal network made it possible to equalize the pressure in it and reduce the hourly consumption of water. The annual saving was 2500 kw-hours of electric power and 48 tons of fuel.

The exhibition will be open until 1 June 1979. Seminars are conducted in the pavilion on the exchange of experience on the exposition theme, and consultation meetings between specialists are arranged.

2291
CSO: 1822

COAL PRODUCTION TO BE RAISED THIS YEAR

Bonn DIE WIRTSCHAFT DES OSTBLOCKS in German 2 Mar 79 p 5

[Text] Soviet coal production will be raised to 752.3 million tons this year and thereby be increased by 28.3 million tons compared to 1978. Of this quantity, 583.2 million will fall to the 7 largest districts, being apportioned as follows:

Donets Basin	222.7 million t	Kans-Atshinsk	34.4 million t
Kuznetsk Basin	154.9 million t	Petshora	29.8 million t
Ekibastus	64.0 million t	Moskow	27.6 million t
Karaganda	49.8 million t		

In the past year, the Soviet coal industry registered a shortfall. The targeted production of 724 million tons (251.6 million tons from open-pit mines) was 16 million tons below the planned quantity. Growth compared to 1977 amounted to only 1.9 million tons.

9160
CSO: 1826

BRIEFS

MORE POWER--As reported by the Hungarian weekly newspaper FIGYELO, 20 additional atomic power plants are being built in the Soviet Union. Nineteen plants are already in operation with a total capacity of 1.616 MW. In the entire CEMA area, the fraction of total electrical energy produced by atomic power plants will be increased from 2.6 to 7.5 percent during the period 1975-80. Poland will be the only CEMA country in which no atomic power plants will yet be in operation by the end of 1980. [Text] [Bonn DIE WIRTSCHAFT DES OSTBLOCKS in German 25 Apr 79 p 4] 9160

CSO: 1826

ENERGY CONSERVATION

ENERGY SAVING DISCUSSED

Kishinev SOVETSKAYA MOLDAVIYA in Russian 31 May 79 p 2

[Article by I. Bannikov, chief of the Material Balance Administration of the Moldavian SSR Gosplan: "What You Lose -- You Cannot Bring Back"]

[Text] The directives of the 25th party congress and the June and November (1978) plenums of the CC CPSU gave special attention to thrifty consumption of fuel and power resources. And not because their production is not increasing. The USSR is in first place in the world in producing coal, petroleum and several other types of power raw materials. The situation is that more such resources are required year after year. It is very important not only to mine the mineral resources, reduce losses at all stages of processing the raw materials, but also to utilize thriftily every kilogram of fuel and each kilowatt-hour of electric power.

The consumption of fuel and power resources in our republic grows constantly. In the period after 1970 alone, electric power consumption almost doubled and reached 7 billion kw-hours per year. Every year, 11 million gigacalories of heat and 13 million tons of conventional fuel are also used. The use of petroleum products grows constantly in the mechanization and transportation of agricultural production in the republic. The reduction of raw material losses here by one percent would save 20 to 30 million rubles per year.

But was there a real barrier against thriftlessness everywhere? Not at all. Thus, in the first quarter of this year, enterprises of the Ministry of Light Industry of the republic overspent over 1700 tons of boiler-furnace fuel and over 40,000 gigacalories of heat energy. The same situation exists at the Ministry of the Construction Materials Industry. A great deal of gasoline and diesel fuel was overspent during this time by enterprises of the Ministry of Motor Vehicle Transport and the Moldavpotrebsoyuz.

Fighting losses is not only of economic but also of social importance. Petroleum products lost in operating a machine, transportation, storage and gassing-up disappear without a trace, but pollute the environment. Therefore, the fight against reducing petroleum product losses must be directed

to improving conditions of labor also and providing clean working positions of high standard for machine operators.

As is well known, the reliability of operation and life of the machines depend on the proper selection and skillful use of fuel and lubricating materials. However, this factor is not taken into consideration everywhere. Not all farms filtrate diesel fuel in order to remove water and other mechanical impurities.

In recent years republic innovators proposed building petroleum bases on slopes. The advantage of this is that fuel could be poured by gravity. This would save electric power, reduce labor and prevent losses (about 2 to 3 percent of the annual consumption would be saved, or 15 to 20 tons). Kolkhozes imeni Kirov in the Chimishlinskiy Rayon, the "Drumul Leninist" in the Kotovskiy Rayon and the "Trusheny" sovkhoz plant in the Strashenskiy Rayon have petroleum bases located on slopes. Regrettably, the experience of such bases is not spreading very fast.

As shown by investigations, such sources of fuel and lubricating material losses as leakages, spillage, evaporation etc. have still not been eliminated. Yet the elimination of such shortcomings is an important reserve. Suffice it to say that only one loose connection between a pipeline and a reservoir leads to daily losses of 6 to 7 kilograms of fuel and increases to 2 - 2.5 tons per year. The use of contaminated and water-logged fuel, which is frequent on farms that do not clean the petroleum base reservoirs internally leads to the wearing out of the fuel system of diesel engines.

A certain amount of experience in the operation of specialized links on the technical servicing of petroleum base equipment was accumulated at mechanization associations of the Rybnitskiy, Sorokskiy and Leovskiy rayons kolkhoz Soviets. Here, once a year, petroleum bases are technically serviced at each kolkhoz. A considerable reduction in fuel consumption per hectare of plowed area is achieved and the repair costs of engines and fuel devices are being reduced.

The experience of operation of the Rybnitskiy, Sorokskiy, Chadyr-Lungskiy, Brichanskiy, Eginetskiy and other mechanization associations for centralized delivery of fuel shows that the unit cost of transporting petroleum products by specialized detachments is more than halved. In Rybnitsa, for example, a specialized detachment was created in the "Kolkhoztrans" Association. The detachment has 13 gasoline carriers (previously this work was done by 36 gasoline carriers of the farms). During the year, the detachment transports over 10,000 tons of petroleum products. Delivery to farms is on a centralized basis by contracts with the farms in accordance with special schedules. Due to the preservation of the quality of the fuel and lubricating materials, there was greater reliability and longer operating life of diesel fuel devices and of the engines themselves, and costs for repairs and the consumptions of spare parts were reduced by 8 to 12 percent. Centralized technical servicing of petroleum bases and centralized delivery of petroleum products mean an annual economic savings for the rayon of about 40,000 to 50,000 rubles.

The record keeping of the use of fuel, electric power and coal has many shortcomings. A number of farms do not keep a record of coupons for fuel issued to the tank-truck drivers. Road lists are filled out improperly, no measurements are made of the gasoline in the tanks and there is no order in recording the fuel.

The kolkhozes and sovkhozes have maximum limit books and the brigades of individual farms -- special cumulative logs for recording the fuel supplied for and consumed by tractors. This, by the way, is being done at training sovkhozes "Kriulyany" of the Kriulyanskiy Rayon, "Ketrosy" of the Novoanenskiy Rayon and a number of other farms. This made it possible to save 2 to 5 tons of fuel annually due to strict monitoring.

Zealous farming means placing strong barriers against any losses. Fighting for saving is not a short-term drive and it should be conducted systematically. "Are You Using Fuel and Power? -- Save Them" -- this slogan must become and remain the norm of life today.

Checks made by Gosplan workers indicated that ministries, departments, enterprises and organizations began paying greater attention to conserving resources. The majority of enterprises, construction sites, organizations and central apparatus of ministries and departments of the republic created subdivisions for setting norms for the consumption of fuel and power resources. In 1978, about 12,000 tons of fuel were saved (conditional fuel), 46,300 gigacalories of heat, and 64 million kw-hours of electric power. The tasks of additional saving of boiler-furnace fuel, heat and electric power were fulfilled for the republic as a whole.

Yet, the work standard in the oblast on normalizing, saving and utilizing fuel, power and material resources still does not respond fully to requirements. In the Ministry of Housing and Municipal Management, the Ministry of Land Improvement and Water Management, for example, services for normalizing fuel and power resources were not even created. This leads to a lack of monitoring and the overconsumption of fuel, heat and electric power.

An important reserve is utilizing secondary power sources. However, the managers of some enterprises and organizations give this problem little attention. Thus, the Sorokskiy gormolzavod [expansion unknown] does not use the condensate and loses, in this case, 460 gigacalories of heat annually. The Kishinev Canning Combine does not utilize the spent steam of autoclaves to wash machines and loses 420 gigacalories annually.

The role of economical services is great in the fight for the saving mode. They are called upon to set up strict monitoring of the consumption of fuel and power resources not only in an enterprise, construction site, but also in each shop, section and working position.

2291
CSO: 1822

ENERGY CONSERVATION

MINISTRY OF PROCUREMENT SAVES ENERGY

Frunze SOVETSKAYA KIRGIZIYA in Russian 2 Jun 79 p 2

[Article by A. Khlebnikov: "Without Accurate Sighting"]

[Text] Over 700,000 kilowatt-hours of electric power were saved in 3 months by enterprises of the Ministry of Procurement [Minzag] of the republic. Is this a lot or a little? Are all loss channels closed?

Alas, the savings obtained are by no means the result of skillful management and monitoring on the part of the ministry. It is the initiative of individual enterprises which, regrettably is not always supported from the top as it should be. The records of costs and accounting have been so neglected for many years that they give no idea of the situation in the ministry as a whole. Under such conditions it was impossible to speak about planning to save fuel. Only this year is the Minzag taking measures to rectify the situation -- record keeping is being set up, performers are being trained to keep the records properly and data on the consumption of fuel and the utilization of electric power is now being gathered regularly.

However, order is being introduced neither energetically nor skillfully enough. For example, at the start of the year, the power people gave their proposals on saving electric power and fuel. The ministry gathered them into a general document, but did not define the responsible executors or the schedules of introduction. No wonder that many proposals remained on paper only.

Measures on saving fuel also remained on paper. Not a kilogram of fuel was saved in the first quarter. Power for producing a ton of products at the Rybachinskiy Grain Products Combine is almost double the norm and is 3.17 kilowatt-hours per ton of products. The enterprise began operation only last year, but part of the equipment and the elevators are already inoperable due to improper adjustment and operation. To start a technological line in the mill, the operator runs from the sixth to the first floors pushing buttons. Until he gets to the lowest floor where the raw material is supplied, the remaining machines are operating at no-load and wasting electric power.

The ministry lacks a centralized system for repairing and adjusting power equipment and has no specialized power services at the enterprises. At best, they have 1-2 electricians per hundred units of equipment. They cannot handle preventive maintenance and can hardly cope with eliminating accidental breakages. Therefore, for many years, the electric equipment, until it wears out, has almost no preventive maintenance. When an engine goes out of order, enterprise managers, in order not to stop production, buy any other equipment. It thus happens that at many combines electric motors of higher power are used and saving modes are not observed.

What does the ministry do? Is it not its duty to create well-equipped power services in enterprises? This is especially so because decree No 946 of 29 December 1973 of the CC CPSU and the USSR Council of Ministers "On measures for raising the efficiency of utilizing fuel and power resources in the national economy" states directly: "Ministries and departments of the USSR and Councils of Ministers of union republics must approve in 1974 typical structures of energy services of enterprises and organizations depending upon the volumes of production and consumption of fuel and power resources." Five years have passed but no power services exist in enterprises or the apparatus of the Minsag of the republic.

The problem of centralized repairs of power equipment has also not been solved. Managers of the Gosplan and the ministry were not able to solve a generally simple problem -- at what plants in the republic to make 600 preventive maintenance repairs per year. An entire industrial sector exists as a poor relation. Yet every day, ministry enterprises consume a huge amount of electric power. Reducing expenditures by one percent would save hundreds of thousands of rubles of government money.

2291
CSO: 1822

ENERGY CONSERVATION

THERMONUCLEAR ENERGY

Moscow SOVETSKAYA ROSSIYA in Russian 2 Jun 79 p 3

[Article: "Confining the Sun"]

[Text] No matter how great the earth's reserves of uranium are, they are not endless. That is why scientists in leading countries are searching persistently for more efficiency energy sources and are trying to make allies of the forces of the winds, ocean tides, sun's rays and geothermal waters. But perhaps science puts its greatest faith in thermonuclear installations, theoutlines of which can already be seen clearly today. It is with their help that specialists must ignite the handmade sun and implement a controlled synthesis of heavy isotopes of water.

Calculations show that one liter of water, if "ignited" by the new method is equivalent in calories to 300 kilograms of gasoline and a ton of coal. However, the road to the cherished thermonuclear reaction is thorny and there are a great many unsolved scientific and engineering problems. The main one is to obtain colossal previously unthinkable temperatures. Scientists must obtain on earth not a short-term but a constant temperature of 60 million degrees -- this is the goal to be reached so finally, the cherished reaction is to proceed.

Science uses the most varied means and methods to solve the problem. The whole world knows about the famous Soviet "Tokamak" installations for obtaining high temperature plasmas. There is a whole family of them, they are designed for various modes and are solving many scientific problems successfully. It is not by accident that scientists of the United States, France, England and other countries have traveled the road built by the Soviet Union.

We have just witnessed the birth of another promising installation. The "Angara-5" experimental thermonuclear reactor was created in the Soviet Union. Forty-eight accelerators will service its "boiler." The electron streams they generate will begin to "shoot at" its nuclear content in turn and will raise its temperature step-by-step to 70 (!) million degrees. Here it is, the so far invincible barrier which, apparently, will possibly be overcome in the very near future.

The idea of the superreactor was put forward by scientists of the Institute of Nuclear Energy imeni Kurchatov. Specialists of the Scientific Research Institute of Electrophysical Apparatus imeni D. V. Yefremov of the USSR Government Committee on Utilizing Nuclear Energy, the Leningrad "Elektrosila" Association imeni S. M. Kirov and a number of other domestic organizations will work on its practical implementation.

So far, the "Angara-5" is only a demonstration and not an industrial installation. It has a leading role -- to prove the practical possibility of achieving a constant thermonuclear reaction.

2291
CSO: 1822

ENERGY CONSERVATION

TRAINING IN ECONOMY

Moscow EKONOMICHESKAYA GAZETA in Russian No 23, Jun 79 p 5

[Excerpt from article "An Effective System of the Economy"]

[Text] In our work we strive to train each productive collective and all workers in the oblast to have a thrifty attitude toward the consumption of metal, fuel, electric power, heat and petroleum products. We place great importance on the system of increasing the skill of cadres, the work of seminars and management of all links of political and economic education. These problems are discussed constantly at director councils.

Instructions were developed on saving fuel-power resources and changes or additions were made in job instructions for most workers and engineering-technical workers, taking into consideration the special features of production.

The implementation of a complex of measures on economy and thrift helped a number of enterprises to reduce constantly the unit consumption norms of fuel, electric power and other material sources for manufacturing a unit product. Thus, at Belovskaya GRES fuel consumption for producing one kilowatt-hour of electric power is 335.9 grams, at Tom'-Usinskaya -- 360.5 which is 8.1 and 23.5 grams respectively less than the rated level and considerably less than the average indicators for the industry for similar equipment.

Systematic, purposeful work of the party, Soviet and social organizations, and high labor and creative activity of workers made it possible to save, in 3 years of the 10th Five--Year Plan period, 871 million kilowatt-hours of electric power, over 490,000 tons of conventional fuel and 1.6 million gigacalories of heat. The experience accumulated in the oblast on organizing socialist competition for saving fuel and power resources is being demonstrated at the USSR VDNKh.

At the same time, we understand that this imposes a special responsibility on us. Moreover, that in spite of certain successes, many reserves and possibilities are not being utilized fully. In some individual enterprises and organizations, thrifty consumption of materials, fuel and power still has not become an urgent matter.

"There is still the habit, a tradition of a kind, to devote more attention to increasing the volume of production rather than improving the quality of the product and the efficient utilization of the products made," stated L. I. Brezhnev, at a meeting with inventors. "But with the huge scale of the economy, the latter factor becomes of decisive importance. By exercising thrift fully it would have been possible even at the present level of production to improve greatly the country's needs in metal, fuel, construction materials and consumer goods."

This applies entirely to our oblast. It is enough to say that annual losses in shipping coal from Kuzbass into other economic regions amount to hundreds of thousands of tons.

We have also encountered certain difficulties. Due a lack of devices, proper accounting and monitoring of the consumption of fuel, heat and electric power are not organized everywhere. Last year our orders were satisfied by 20 to 25 percent. There are no registers in the coal industry to account for coal in explosion-proof form. There is no organized accounting of fuel consumption in boiler facilities although there are almost 3500 of them in the oblast and they use 8 million tons of coal and 35,000 tons of fuel oil annually. In a number of enterprises the unit norms of consumption for making products are set up without sufficient technical-economic substantiation, and are planned on the basis of what has been achieved. There are also a number of other problems that make the organization of socialist competition diffcult.

The oblast party organization continues to improve and find new forms and methods of organizational political work to mobilize Communists and all workers to increase further the efficiency of social production, saving fuel-power resources in every possible way and fulfilling successfully the plan for 1979 and the five-year plan as a whole.

2291
CSO: 1822

BRIEFS

SOLAR ENERGY--The Gosgrazhdanstroy considered the problem "On prospects of introducing solar energy technology in housing and municipal construction (using solar heat for heating, the hot water supply and cooling buildings)". It was noted at the meeting that in 1976-1978 a number of institutes basically completed scientific research and design work on using solar energy. The operation of six experimental facilities with solar heat and hot water supply proves the technical possibility and economic feasibility of using solar energy for sanitary and domestic needs. To accelerate the work in this direction, the committee ordered that the KievZNIIEP be the main scientific research and design organization in the Gosgrazhdanstroy system. It was also given the functions of a coordinator. It should concentrate its efforts on using solar technology for hot water supplies and air conditioning. The TashZNIIEP should concentrate on heating water by using solar energy and the TbilZNIIEP--on heating air. A number of technical-economic problems were entrusted to the TsNIIEP of Engineering Equipment. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 10 Jun 79 p 1] 2291

HEAT INDICATORS -- The Gosgrazhdanstroy approved and decided to introduce standard heat consumption indicators for heating public buildings starting 1 July 1979. They will be applicable to all existing and typical individual project designs being newly developed. In preparing working drawings of typical and individual project plans and correcting existing typical plans of public buildings, designers should be guided strictly by the standard indicators of unit heat consumption for heating public buildings, including them in the certificates of typical plans. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 10 Jun 79 p 1] 2291

NEW PETROLEUM -- Tomsk -- The first kilometers of a new petroleum pipeline from the Parabel'-Luginetskoye deposit were welded. Petroleum was found in this deposit in deep-lying rocks. For the first time, workers will begin to work with great vigor. Planning of still another settlement for petroleum workers in the Narynskaya Taiga has started. [Text] [Moscow IZVESTIYA in Russian 20 May 79 p 1] 2291

PIPE LAYER -- Ocher, Permskaya Oblast -- A new pipe layer, the series production of which began at the Ocher Machine Building Plant, will help main petroleum and gas pipeline builders overcome taiga swamps. Unlike previous machines, it is equipped with a higher power engine and a greater load capacity -- 12.5 tons. [Text[[Moscow IZVESTIYA in Russian 20 May 79 p 1] 2291

MECHANIZED COAL MINE -- Magadanskaya Oblast -- A comprehensively mechanized longwall with a productivity of over 1000 tons per day was put in operation at the "Beringovskaya" mine. All the processes, from installing supports to delivering the coal to the surface, were fully mechanized. B. Rogoza's brigade of stope miners assimilated the rated capacity of the longwall considerably ahead of schedule. Another mine -- the Anadyrskaya," is also being modernized. The renovated mine will double present coal production. [Text] [Moscow IZVESTIYA in Russian 24 May 79 p 1] 2291

KOSTROMSKAYA GRES -- Kostroma -- The construction site of the new stage of the Kostromskaya GRES received the last parts of the boiler unit for the 1,200,000 kilowatt power unit. They are joined into large units on a special site and will be delivered to the installation place -- the main building. The boiler, weighing almost 25,000 tons, will have no foundation but will be suspended from the frame of the building. [Text] [Moscow MOSKOVSKAYA PRAVDA in Russian 30 May 79 p 1] 2291

NEW TRANSMISSION LINE -- ASHKHABAD -- A high power LEP-500 will pass through the sands of the Karakum. Yesterday the first masts were installed on the route of the electric transmission line. The 375-kilometer main line will connect the largest electric power plant of Turkmenistan -- the Marygres, with the consolidated power ring of Central Asia. It will make it possible to increase the reliability of the electric power supply to enterprises and farms of the republic. [Text] [Moscow MOSKOVSKAYA PRAVDA in Russian 20 May 79 p 1] 2291

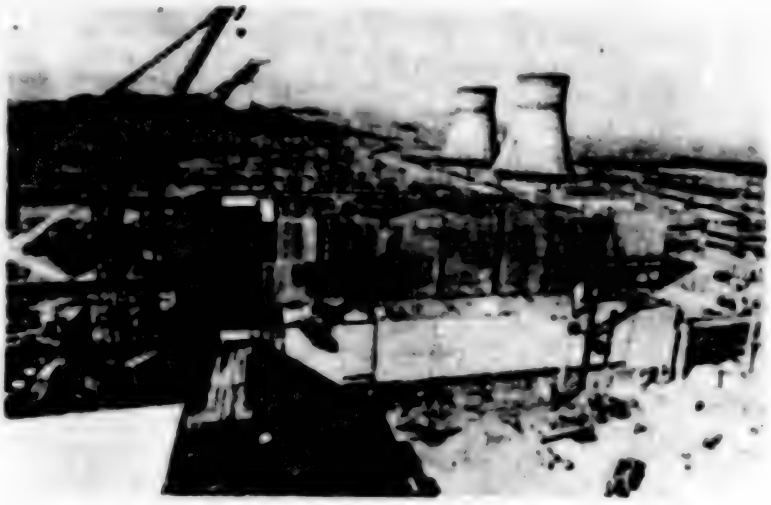
CSO: 1822

FUELS AND RELATED EQUIPMENT

PHOTO OF AKHMIANSK NUCLEAR PLANT

Hanoi QUAN DOI NHAN DAN in Vietnamese 27 May 79 p 4

[Text]



Construction of the Nuclear Generating Plant

During its present Five-Year Plan, the Soviet Union is strongly developing its electricity sector, increasing its capacity to between 67 and 70 million kilowatts over the previous Five-Year Plan. The nuclear generating plants will have a capacity of between 13 and 15 million kilowatts. Two of them, with a capacity of 4 million kilowatts each, will be among the largest in the world.

5616
CSO: 4209

UDC 665.622.43.066.5.013:665.63.013

STUDY OF MODIFIED DESALINIZATION UNITS AT REFINERY

Moscow NEFTEPERERABOTKA I NEFTEKHIMIYA in Russian No 4, 1979 pp 3-6

[Article by L. I. Golomshtok, K. A. Krylova, V. S. Ratush, and V. S. Sokolov: "Examination of the Electrical Desalinizers of Large-Capacity Primary Petroleum Refining Installations"]

[Text] In connection with the sharp increase in the volume of petroleum refining, large-capacity installations for primary distillation have been built in the domestic petroleum refining industry today. These installations include electrical desalinizers for preliminary preparation of petroleum for processing. Because future plans envision the construction of precisely such installations, and even larger ones, an examination of existing large-capacity installations, in particular the electric desalinization blocks, is especially interesting. For our investigation we chose the electrical desalinization blocks of the high-productivity ELOU-AVT [electrical desalinizer-atmospheric vacuum pipe still] and ELOU-AT [electrical desalinizer-atmospheric pipe still] installations at the Novopolotsk Refinery.

The electrical desalinization block of the ELOU-AVT installation today has a number of modifications in plan compared to the design. Figure 1 shows a schematic industrial flowchart of the installation.

To increase the productivity of the installation to two supplementary electrical dehydrators (E-5/1 and E-5/2) are mounted on it. They are connected in series and together with the group of heat exchangers constitute desalinization flow III. Unlike the other electrical dehydrators, these ones are built in the form of three-electrode units of the VNIIneftmash [All-Union Scientific Research Institute of Petroleum Machinery] system. Tests made in July 1975 showed that these devices can be loaded to 400 cubic meters an hour, which is 2.5 cycles an hour.

It was decided not to use drainage water from the electrical dehydrators of stage II and the ejection mixers in front of the electrical dehydrators of stage I. This was because the ejectors did not assure normal water delivery and cases were frequently observed where crude oil was

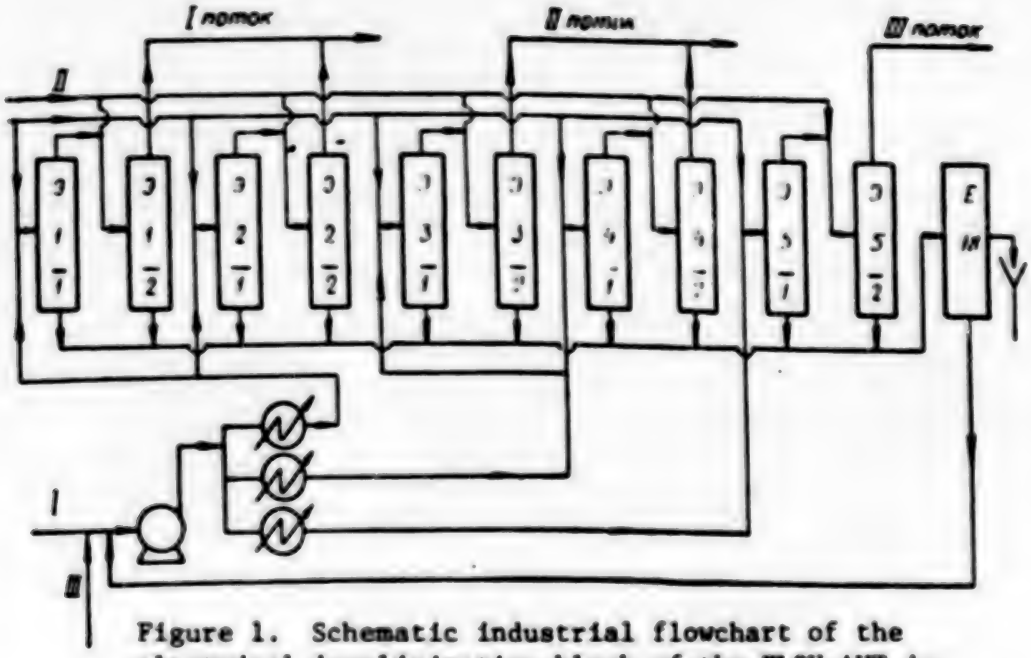


Figure 1. Schematic industrial flowchart of the electrical desalinization block of the ELOU-AVT installation.

Key: (I) Flow of Crude Petroleum;
(II) Flow of Flushing Water;
(III) Flow of Demulsifier Solution.

driven along the water lines into the electrical dehydrators of Stage II. At the present time flushing water is fed by water pumps to the mixing ejectors in front of all electrical dehydrators. There the water is mixed with part of the raw material being fed to the apparatus and the rest of the petroleum is run through a by-pass. After this both flows are joined again and directed along a single pipe to the distribution collectors of the electrical dehydrators. The drains of all the devices are connected into a single collector along which drainage water is sent to settling pond Ye-18, from whose surface the trap product (and also 15-30 cubic meters an hour of drainage water at the present time) is taken and then sent to the intake of the crude pumps. The latter should be considered highly efficient, even though drainage water enters pond Ye-18 after not just the second but also the first stage of desalinization. Calculations made on the basis of average indicators for the quality of crude and desalinized petroleum and data on industrial conditions show that the concentration of chlorine salts in drainage water collected from all the apparatuses increases by just 480 milligrams per liter compared with the water fed for flushing. Therefore, using this water as flushing water in the stage I electrical dehydrators cannot have a negative effect on the quality of desalinization because the average concentration of salts in the water accompanying the crude is 22,000 milligrams per liter. Feeding hot water to the intake of the crude pumps promotes better contact between it and the globules of salt water contained in the petroleum (during the process of mixing in the crude pumps and when the crude is passing through the pipes and heat exchange apparatus) and at the same time increases the amount of flushing water in stage I of desalinization, which is plainly inadequate (2.5 percent for raw material).

The rest of the projected chart was left unchanged.

During the period of examination all petroleum came to the installation from the Druzhba pipeline, whose average quality for the first half of 1975 is given below:

Density, grams per cubic centimeter	0.861
Viscosity, centistrokes	4.6-6.0
Sulfur content, %	1.66-1.9
Acid number, milligrams of KON [expansion unknown] per gram of petroleum	0.45-0.5
Mechanical impurities, %	0.0036-0.006
Water content, %	traces-0.32
Chloride content, milligrams per liter	19-48
Resin content, percent by volume	35-41
Paraffin content, %	3.45-3.65

The working regime of the installation was as follows:

Productivity, cubic meters per hour	1,100-1,200
Use of flushing water, cubic meters per hour	
in stage I	30
in stage II	45
Temperature, degrees C.	
heating crude petroleum	120-130
salt solution from pond Ye-18	110-115
Pressure, atmospheres	
crude pumps	25
water pumps	18
Electrical Dehydrators	
stage I	16
stage II	14

The installation operated steadily during the examination period. The average quality of petroleum prepared in July 1975 for the three desalinization flows was as follows: flow I — 0.1 percent water and 2.6 milligrams of salts per liter; flow II — 0.14 percent water and 2.6 milligrams of salts per liter; flow III — 0.11 percent water and 3.1 milligrams of salts per liter. The average quality of desalinized petroleum for the half year was 0.14 percent water and 2.63 milligrams of salts per liter.

According to the standards adopted at the enterprise the quality of petroleum preparation at the installation is analyzed once a day only by salts and water remaining in the petroleum after the second stage of desalinization.

During the examination readings were taken of the work of the installation by stages (see table). The table gives calculated figures for the maximum capabilities of the stages of desalinization.

(a) Сырая нефть			(b) Первая ступень обессоливания			(c) Вторая ступень обессоливания		
ρ_4^{20}	вода, % (d)	соли, мг/л (e)	вода, % (d)	соли, мг/л (e)	предельные возможности содержания солей, мг/л (f)	вода, % (d)	соли, мг/л (e)	предельные возможности содержания солей, мг/л (f)
0.866	0.15	41.0	0.06	16.1	0.93	0.12	3.2	0.48
0.869	0.16	54.2	0.21	11.3	4.30	0.18	4.1	0.51
0.868	0.18	5.6	0.06	14.0	1.27	0.18	2.6	0.66

Table. Indexes of the Work of the Electrical Desalinization Block of the ELOU-AVT Installation.

Key: (a) Crude Petroleum;
(b) First Stage of Desalinization;
(c) Second Stage of Desalinization;
(d) Water, percentage;
(e) Salts, milligrams per liter;
(f) Maximum Capacities for Salt Content, milligrams per liter.

As the data in the table show, the quality of petroleum preparation in the electrical desalinization block is far from the best possible level, which indicates inadequate contact between the crude petroleum and the flushing water which is a result of a poorly organized mixing process. One of the reasons for this may be an inadequate amount of water fed for flushing (2.5 and 3.5 percent respectively in stages I and II).

The fact that the petroleum coming for refining has less than three milligrams of chlorine salts per liter should be credited to the quality of the raw material coming to the Novopolotsk Refinery (the salt content in the crude petroleum is less than 50 milligrams per liter) whereas at the Moscow Refinery, for example, where the quality of desalinized petroleum is similar the chloride content in incoming crude oil is 600-1,000 milligrams per liter.

At the same time as we examined the electrical desalinization block of the ELOU-ATV installation we took readings on the work of the electrical desalinization block of the ELOU-AT installation which also works with petroleum coming from the Druzhba pipeline.

To increase the productivity of the ELOU-AT installation, two EG-160 electrical dehydrators were added to the electrical desalinization block and the projected diagram was altered as shown in Figure 2 below.

The crude oil passes through the heat exchangers in three flows, after which it goes to a main collector which distributes it evenly to five electrical dehydrators connected in parallel that make up the first stage of desalinization. The flushing water and demulsifier solution for the first stage are fed to the intake of the crude pumps.

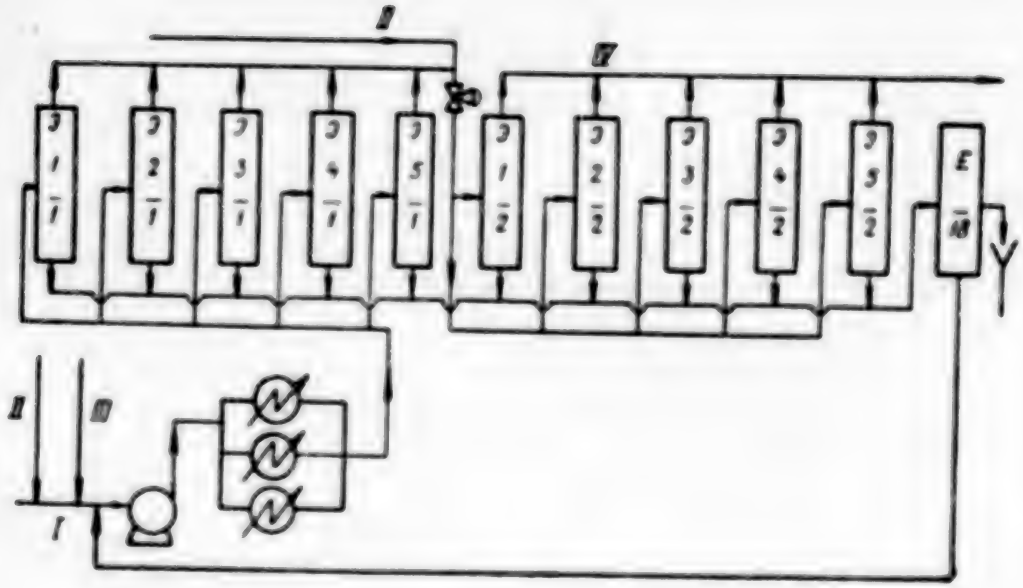


Figure 2. Basic industrial flowchart of the electrical desalinization block of the ELOU-AT installation.

Key: (I) Flow of Crude Petroleum;
(II) Flow of Flushing Water;
(III) Flow of Demulsifier Solution;
(IV) Desalinized Petroleum.

The partially desalinized petroleum emerging from the electrical dehydrators of the first stage is sent to a main collector and, after passing through a unit that mixes the petroleum with flushing water, is evenly distributed to the five electrical dehydrators of the second stage. The unit that mixes the petroleum with the water has specially designed nozzles cut into the collector to feed flushing water. The stream of flushing water forms a fan-like spray that makes it possible to distribute it evenly over the entire cross-section of the pipe. It was not possible to evaluate the operating efficiency of this mixing unit on the spot because there were no countersamplers, but judging by the uniform amounts of drainage water coming out of the electrical dehydrators of the second stage it appeared that the flushing water was fairly well distributed in the volume of petroleum coming through the collector to all five devices.

The desalinized petroleum emerging fr[illegible]cond stage electrical dehydrators is brought back to one col[illegible]d sent for refining. The drainage water from all 10 devices is [illegible] through a main collector to a supplementary Ye-18 settling pond and then to decontamination facilities.

These are the principal differences between the industrial chart of the electrical desalinization block of this installation and the projected chart. The capacity of the electrical desalinization block was increased by this redesigning. Moreover, the installation makes no use of ejection mixers and the desalinization system consisting of a series of parallel flows, each of which is two electrical dehydrators connected in series. Both concepts should be considered useful. A shortcoming of this modification is the decision not to use drainage water from the second stage electrical dehydrators for flushing the crude petroleum.

The industrial regime of the work of the electrical desalinization block is similar to the working regime of the desalinization block of the ELOU-AVT installation. The only discrepancies are observed in a somewhat greater productivity for crude (1,200-1,300 cubic meters an hour) and in the amount of flushing water fed to the installation (40 cubic meters an hour in stage I and 30 cubic meters an hour in stage II), which are 3.1 and 2.3 percent respectively. The quality of petroleum preparation in the electrical desalinization block of the ELOU-AT installation on the average in the first half year was characterized by 0.05 percent water and 2.34 milligrams of salts per liter.

These findings testify that, despite its greater productivity, the quality of petroleum preparation in the ELOU-AT installation is slightly better than in the ELOU-AVT iustallation. The difference for the six-month average was 0.26 milligrams per liter, which is 10 percent of the amount of chlorine salts remaining in the petroleum. This is owing to the greater rationality of the chart of the electrical desalinization block of the ELOU-AT installation, but the indexes of its work quality (according to salt content and desalinized petroleum) are also far from the maximum,the best possible figures. Where the degree of water removal from petroleum in the electrical dehydrators is satisfactory this is a result of inadequately mixing the petroleum and the flushing water. The amount of flushing water fed to the petroleum is plainly insufficient.

To overcome this problem it is recommended that all the fresh flushing water being fed to the installation (5-6 percent of the crude) be fed in the second stage of desalinization. It is essential to see that the flushing water is heated to a temperature of 80-90 degrees C. to improve flushing. The streams of drainage water from the second stage electrical dehydrators must be separated from the drainage water being removed from the first stage electrical dehydrators; the former can be used entirely for flushing crude petroleum.

A similar system of feeding flushing water should be set up in the electrical desalinization block of the ELOU-AVT installation.

11,176
CSO: 1822

GEOLOGICAL ORGANIZATIONS MUST USE TRANSPORTATION MORE EFFICIENTLY

Moscow FINANSY SSSR in Russian No 5, May 79 pp 43-45

[Article by Ye. S. Bachurin and G. M. Siluanov: "Reducing Transportation Costs as a Factor in Increasing the Profit of Geological Organizations"]

[Text] An analysis of the activities of geological organizations of the USSR Ministry of Geology indicates the existence of significant reserves for raising efficiency by eliminating unproductive expenditures and losses and maintaining a strict system of economies in the use of physical, labor, and financial resources. There are great opportunities for reducing the prime cost of geological exploration and drilling by cutting the costs of transporting materials, construction designs and parts, equipment, and other loads and in conveying workers.

In 1977 the actual prime cost for the ministry as a whole for geological exploration done by ministry personnel and expenditures for deep exploratory drilling for petroleum and gas were 16.3 million rubles or 1.7 percent higher than planned. A similar situation took shape in the first half of 1978. The actual prime cost of a meter of deep exploratory drilling in 1977 was 407.3 rubles, 1.7 percent higher than the planned figure and 10.8 percent more than the actual prime cost for the preceding year. This situation is in large part a result of the increasing cost of transportation. In the first half of 1978 actual expenditures under this subheading exceeded planned figures by 6.4 million rubles or 2.9 percent.

Transportation expenditures are one of the main categories in the cost of geological exploration and drilling work. They account for 16.6 percent of the prime cost of the work done, an amount of more than 420 million rubles.

In 1978 financial agencies of the RSFSR, Uzbek, Kazakh, and Azerbaijan SSR's conducted audits of the use of capital for transportation expenditures in a number of geological organizations of the USSR Ministry of Geology.

The findings of these investigations indicate that the necessary steps to use this capital economically are not being taken everywhere. Thus, actual transportation expenditures in deep exploratory drilling at 17 of the organizations of the RSFSR Ministry of Geology that were audited were 71.2 million rubles compared to 69 million at the planned cost. A large part of the rise in cost (1.9 million rubles) is accounted for by the Main Tyumen' Geological Administration. Planned transportation expenditures were significantly exceeded in the Gur'yev Geophysical Expedition of the Kazneftegazrazvedka [Kazakh Petroleum and Gas Exploration] Administration, the Zyryanov Geological Exploration Expedition of the East Kazakhstan Territorial Geological Administration, and the Dzhezkazgan Geological Exploration Expedition of the Central Kazakhstan Territorial Geological Administration.

One of the principal reasons for the increase in transportation costs at certain organizations was the increase in estimated expenditures for air and vehicle transportation. In 1977, for example, the estimate for air transportation expenditures in the East Siberian Geological Administration was exceeded by 1.2 million rubles or 20.8 percent. Because of imprecise transportation planning aviation there is used without controls; evidence of this is seen in the numerous empty runs by helicopters. All this could not fail to cause a sharp increase in expenditures for transportation services; they rose 42.2 percent in 1977 compared to the previous year.

These expenditures were allowed to increase significantly in the Hydrogeological Expedition of the Kamchatka Geological Administration, the Tarko-Salinskaya Petroleum Exploration Expedition of the Main Tyumen' Geological Administration, the Preobrazheniye Petroleum Exploration Expedition of the East Siberian Geological Administration, the Central Geological-Geophysical Expedition of the Kazakh SSR Ministry of Geology, and others.

In 1977 the geological organizations of the RSFSR Ministry of Geology that were audited shipped 74.8 percent of all freight by air, and the cost of transporting a ton of freight rose significantly. At the Main Tyumen' Geological Administration, for example, expenditures per ton were 441 rubles 59 kopecks in 1977 compared to 340 rubles 18 kopecks in 1976. The significant expenditures were caused by the use of air transport not only to move freight but also to take expedition personnel to their places of work and bring them back.

The geological organizations allowed trips by helicopters that were not fully loaded and expensive air transportation was used in places where it was not planned. For example, the Khanty-Mansi Geophysical Trust of the Main Tyumen' Geological Administration shipped core samples for drilling in small batches, not making full use of helicopter capacities.

In this same trust spare parts and equipment were delivered to a seismology detachment and parties were moved from place to place by means of MI-8 helicopter. This resulted in 27,000 rubles of expenditures beyond

the estimate. Seismology party SP-2 shipped fuel, lubricants, and equipment in IL-76 and AN-24 aircraft whereas these things are supposed to be shipped by motor vehicle and river transportation. This cost 20,000 rubles beyond the estimate.

Aviation was used in place of river transportation in 1977 at the Tarko-Salinskaya Petroleum Exploration Expedition of the Urengoyneftegazgeologiya [Urengoy Petroleum and Gas Geology] Association of the Main Tyumen' Geological Administration to deliver freight from Salekhard and to build up the Venge-Yakhinskaya site. The use of more expensive transportation was observed at the Kamchatka and East Siberian geological administrations of the RSFSR Ministry of Geology.

As for motor vehicle transportation, actual expenditures for it were above planned figures at the Balkhash Comprehensive Geological-Geophysical Expedition, the central Kazakhstan territorial geological administration of the Kazakh SSR Ministry of Geology, the Lesser Caucasian Geological Exploration Expedition of the Administration for Geology of the Council of Ministers of the Azerbaijan SSR, and other organizations.

The capacities of the motor vehicle fleet are not being used fully. Organizations of the USSR Ministry of Geology have not always maintained proper checks on operation of trucks and compliance with rules for keeping track of their use. As a result, we see downtime for loading and unloading, empty runs, and incomplete use of vehicle load capacity, false reporting and goods shipping documents, and overexpenditure of fuel and lubricants. In the East Siberian Geological Administration in 1977, for example, the coefficient of vehicles on the line was 47 percent compared to a planned figure of 52 percent; the corresponding figures in the Northeast Geological Administration were 53.7 and 55 percent. Various other organizations have also failed to reach the planned vehicle coefficient.

Inefficient use of capital for transportation expenditures is also the result of mistakes such as overexpenditure of fuel and lubricants, incorrect organization of loading and unloading and taking drilling teams away from their main work for loading, incomplete use of trailers, and imprecise planning of shipments.

In 1977 the Khanty-Mansi Geophysical Trust used 716,600 liters of gasoline for shipping freight by motor vehicles compared to a norm of 621,100 liters. The Preobrazheniye Petroleum Exploration Expedition of the East Siberian Geological Administration is not saving fuel and lubricants either.

The Main Tyumen' Geological Administration has not established proper checks on compliance with estimated transportation costs. During audits of subordinate organizations there they do not check the records of compliance with estimated transportation expenditures.

Motor vehicle transportation undergoes significant losses owing to unsatisfactory supply of spare parts to motor pools, poor organization of

vehicle repair, and the inadequate capacities of repair centers. For these reasons the use coefficient of trucks at geological organizations averages no more than 0.55, whereas if these difficulties were eliminated it could be raised to 0.75-0.90. This is confirmed by the experience of leading motor pools.

The use coefficient of vehicle load capacities was found to be lower than planned at many of the geological organizations that were inspected. The use coefficient of distance driven by vehicle transportation also remains very low. The lack of a unified plan for hauling freight prevents the use of return hauls and selecting the shortest shipping distances.

In many cases the actual expenditures of geological organizations for loading work are much higher than computed in estimates. The reasons for the high cost of this work are unsatisfactory organization and inadequate mechanization. For example, in 1977 and the first half of 1978 loading and unloading work was done manually at the Preobrazheniye Petroleum Exploration Expedition of the East Siberian Geological Administration, which caused barge downtime. The Bratsk Petroleum Exploration Expedition of the same administration paid 9,000 rubles in fines for railroad car downtime in 1977. The brigade of loading workers there was not fully staffed and workers from the drill teams were taken away for loading and unloading work.

The primary technical-operations indexes of the work of organization-owned truck transportation were not fulfilled because trucks were not kept in good working condition; they were used inefficiently, and vehicle repair work was poor in quality and late. In many cases this made it necessary to call in the services of more expensive forms of transportation. Thus, the winter (1976-1977) plan for hauling in materials was 83.9 percent fulfilled for the Lena Expedition of the East Siberian Geological Administration and 50 percent fulfilled for the Preobrazheniye Expedition. The remaining freight had to be shipped by air.

One of the principal reasons for the low operating indexes of vehicle transportation is dispersion of the vehicle fleet at small motor pools. They cannot provide good, timely repair work, supply spare parts, or create the necessary conditions for application of a more sophisticated system of line operations.

The inspections found that many geological organizations take a formalistic approach to working out plans to bolster checks on compliance with estimates of transportation expenditures and to improve the work of their own transportation. No such measures were worked out at all in some organizations such as the Main Tyumen' Geological Administration and the East Kazakhstan Territorial Geological Administration. Monitoring the use of capital for transportation expenditures is on a low level in the Kamchatka Territorial Administration and its subordinate organizations.

Late last year the USSR Ministry of Finance , USSR Gosbank, and the USSR Central Statistical Administration, with the consent of USSR Gosplan and Gossnab, ratified a new official instruction document entitled "Procedures for Charging for Freight Shipping by Motor Vehicle Transportation," standard forms for the goods transportation invoice and certificates of measurement (weighing) for non-commodity freight, as well as new standard forms for trip logs in order to improve the use of truck transportation.

The instructions went into effect on 1 June 1978 and are mandatory for all enterprises, organizations, and institutions which have their own means of transportation or use the vehicles of other organizations to ship freight, regardless of their departmental affiliation. The instructions make large, fundamental changes in procedures for paying for freight shipping. All organizations and motor vehicle transportation enterprises must make provision for systematic checks on fulfillment of these instructions and establish proper procedures in keeping track of the work of vehicle transportation.

The fact that transportation expenditures are exceeding estimated amounts and that they are growing significantly in geological organizations offers evidence that the ministries of finance of certain republics are not giving adequate attention to this matter in their auditing and analysis of financial management activities. They do not always check the grounds for expenditures. Financial agencies and institutions of USSR Stroybank should demand that geological organizations spend capital for transportation services wisely. There must be effective monitoring of the efforts of these organizations to improve the technical-operating indexes of the work of their own means of transportation and compliance with estimates of transportation expenditures. During audits there must be a careful analysis of expenditures for shipping for each installation. The auditors must disclose the reasons for growth in expenditures and, when necessary, see that less expensive forms of transportation are substituted for more expensive ones.

11,176
CSO: 1822

OFFICIALS PUNISHED FOR MISMANAGEMENT, CORRUPTION

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 May 79 p 2

[Response by A. Zhdanov, deputy minister of the petroleum industry: "Responses to SOTSIALISTICHESKAYA INDUSTRIYA"]

[Text] The Ministry of the Petroleum Industry has carefully reviewed the article "Wheeler-Dealers and Their Patrons," published in SOSTIALISTICHESKAYA INDUSTRIYA on 13 April 1979.

V. L. Krasnovskiy, head of the Administration of Upper Volga Trunk Petroleum Pipelines (AUVTPP) of Glavtransneft' [Main Administration for Transportation and Delivery of Petroleum] of the USSR Ministry of the Petroleum Industry, has been discharged from his position for violations of state discipline permitted and using his official position for personal ends.

A. M. Gusarov, deputy chief of Glavtransneft', and I. T. Dyuzhikov, chief bookkeeper, have been severely reprimanded for illegally instructing AUVTPP to transfer 17,000 rubles and for unsatisfactory monitoring of the work of subordinate organizations.

S. S. Dykin, chief power engineer of Glavtransneft', has been severely reprimanded for performance of work on a labor agreement concluded with the subordinate AUVTPP.

V. S. Ivanenko, deputy chief of Glavtransneft', has been reprimanded for illegally authorizing enrollment of employees of the L'vov Directorate as holding combined positions at trunk pipelines under construction in the AUVTPP.

A. A. Kulikov, chief of Glavtransneft', has been informed of the unsatisfactory monitoring of compliance with state discipline at AUVTPP and told to work out and take concrete steps to insure elimination of the violations that were found.

The ministry is taking steps to strengthen its management of AUVTPP.

11,176

CSO: 1822

NEW MOBILE DRILLING RIG IN PRODUCTION

Moscow PRAVDA in Russian 23 May 79 p 3

[Article by L. Spektor, Alma-Ata: "Drilling Rig on Wheels"]

> [Text] Production of drilling rigs with hydraulic telescopic masts has begun in Alma-Ata. The device is mounted on a platform with a bogey equipped with pneumatic tires.

Kazakhstan is rich in minerals. Dozens of expeditions of geologists are constantly searching for deposits. To do this they drill exploratory wells. They install derricks of prefabricated metal designs that are cumbersome and require several days for installation and preparing the equipment for operations. A compact drilling rig is now coming to the aid of the geologists. It looks like a railroad car made of double-layered aluminum. Polyurethane foam, an insulator, is contained between the aluminum sheets. The mast is packed on the roof. When a button on the control console is pushed a pipe begins rising and the design elements "emerge" from it. The last stage reaches a height of 18 meters. The blocks and lines secured to the mast make it possible to perform lowering and lifting operations. The machine can sink a well to a depth of 800 meters.

The drilling machine is mounted in the car on a special platform, and a set of pumps is located there also.

In the front part of the "shed" is the foreman's area with a desk, work bench, tool cupboard, and washstand with hot and cold water. The area is heated electrically. In short, it is perfectly comfortable. Drillers can work in rain and during snowstorms.

The final point is that the drilling rig on wheels can be moved quickly and easily to the necessary work area by tractor or truck. Only a few minutes are required to get the rig ready to work.

11,176
CSO: 1822

IMPROVED CONTROL OF COAL LOSSES DURING MINING NEEDED

Moscow EKONOMICHESKAYA GAZETA in Russian No 21, May 79 p 16

[Article by V. Luksha, deputy administration chief, Kuznets District of USSR Gostekhnadzor: "Guard Against Losses of Coal During Mining"]

[Text] The Kuznets Basin has rich coal reserves that play a large part in the overall balance of national fuel-energy resources. The initiative of leading mining brigades in the Kuznets Basin under the slogan "Prevent Underground Losses of Fuel" has found support not only in our basin, but also in other coal mining regions. This initiative is an organic part of the patriotic movement to conserve fuel and energy resources at the enterprises and construction sites of Kemerovskaya Oblast.

During the years of the 10th Five-Year Plan compared to the Ninth Five-Year Plan coal losses in the mines for the Kuznets Basin as a whole have been cut by 24.6 million tons. But there are great opportunities for further reduction.

The record of coal losses is incomplete. In 1972 the USSR State Committee for Supervision of Industrial Safety and for Mining Inspection ratified the document "Standard Methodological Instructions for Determination of, Establishing Norms for, Recording, and Making Economic Evaluations of Losses of Solid Mineral Products During Mining." Three years later the USSR Ministry of the Coal Industry introduced sectorial instructions. Practice shows that while they have several strong points, the instructions do not regulate the evaluation of the use of coal reserves adequately.

Normative (planned) operating losses of coal during mining are ratified for each enterprise each year. Most production associations in the Kuznets Basin proceed correctly and compare actual coal losses for the year with normative ones adjusted considering the actual development of mining work. But the Kuzbassugol' [Kuznets Basin Coal] and Leninskugol' [Leninsk Coal] associations they orient their work to a fixed level of normative losses ratified for the year, explaining that the sectorial instructions are unclear and they have no precise orders from the USSR Ministry of the Coal Industry. As a result, the figures for above-norm

losses are distorted (the enterprise is charged for them by deductions to the state but just at an increased rate). Moreover, there is no uniform approach to determination of the above-norm losses themselves. Although the agencies of the State Committee for Supervision of Industrial Safety and for Mining Inspection correctly require losses to be determined for each excavation unit or cutting face, the USSR Ministry of the Coal Industry takes a different point of view, saying that above-norm losses are estimated only for the enterprise as a whole.

What is the result of this?

According to the report figures of the associations for two years ago, 15 enterprises permitted 595,000 tons of above-norm coal losses. But our calculation indicated that losses occurred at 63 underground and open-cut mines in the Kuznets Basin and totalled 1,821,000 tons of coal. The picture was approximately the same last year.

Finally, let us consider assignments for coal extraction from the ground during mining; these assignments are established by the USSR Ministry of the Coal Industry each year for each production association. Growth in this exceptionally important index is inadequate at present. The reason is that no definite procedure exists for delivering assignments to the underground and open-cut mines, not to mention to each excavation unit or cutting face. Furthermore, the ministry's assignments themselves are not always well-founded. At some production associations they are significantly lower than the level of coal extraction already attained.

Elimination of such shortcomings in the planning for and recording of fuel losses during mining depends primarily on the attitude and actions of employees of the USSR Ministry of the Coal Industry. The Kuznets District of the USSR State Committee for Supervision of Industrial Safety and for Mining Inspection has made numerous suggestions on this account, but without results. It is true that the ministry commissioned the All Union Scientific Research Institute of Mine Surveying (VNIMI) to straighten out certain normative requirements and work out supplements to the sectorial instructions. But the commission was left unfulfilled.

In recent years the USSR Ministry of the Coal Industry has worked out numerous, in principle quite effective, measures to reduce losses during coal mining. But it has not seen that these steps were carried out in practice in the local areas. Only this can explain, for example, the fact that the production associations did not carry out the ministry's instructions to develop measures at each underground and open cut mine for 1979-1980 (with participation by base and planning institutes) to achieve fuller extraction of coal reserves from the ground.

11,176
CSO: 1822

UDC 656.212.6.073.437:622.33+656.223.2

EFFICIENCY IN SENDING GONDOLAS TO COAL-LOADING RAILROADS URGED

Moscow ZHELEZNODOROZHNYY TRANSPORT in Russian No 1, Jan 79 pp 12-15

[Article by S. L. Al'terman, engineer: "Providing the Coal-Loading Railroads with Means for Shipping"]

[Text] By Way of Discussion

On railroads that are located in regions with a developed coal-mining industry, loading volume greatly exceeds the amount of unloading. Because of this, the railroads that serve the coal basins are constantly experiencing shortages of empty railroad cars, especially gondolas for shipping coal. It should be considered here that in some of these regions the gap between receiving and dispatching is increasing and this requires a strengthening of support for the coal-loading railroads.

Organizing the supply of gondolas to regions that load coal on a large scale is a complicated operating problem. Regulatory measures that are to be conducted for this purpose are being disseminated to many railroads, and they cover tens and, at times, hundreds of thousands of cars that are in the traffic. Estimates indicate that supplying just two eastern coal-loading trunk lines--the West Siberian and the Tselina--regularly with empty gondolas requires that 600-650 unit trains of empty cars be in the traffic. To this should be added the hauling for these same railroads of loaded gondolas that are en route for unloading. All this necessitates constant, thorough analysis of the status and distribution of the car fleet on the rail network, a knowledge not just of the current situation but also of the prospects for forming trains of empties, provisioning for precision in operating discipline, and flexible and responsive shifting of the car fleets.

During the Tenth Five-Year Plan, in accordance with 25th CPSU Congress decisions, more than 90 percent of the planned growth in coal mining will take place mainly in the country's eastern regions--Kazakhstan, Siberia and the Far East. This is showing up even now in outstripping growth in the amount of coal hauled in the East. While coal shipments for the railroad network as a whole increased in 1978 by 4 percent over 1975 (according to the plan), it is growing, correspondingly, on the West

Siberian Railroad by 9.5 percent and on the Tselina Railroad by 13.8 percent. On the Donets Railroad, coal loading has been practically unchanged this year.

One cannot help but note a characteristic feature of this growth. On the Donets Railroad more than 60 percent of the coal is being shipped in local transport, and this haulage continues to grow. On the West Siberian and Tselina railroads, coal loading is being increased mainly for through service, which requires an additional input of gondolas.

In connection with an intensification of solid-fuel mining in the country's eastern regions in the next few years, a further increase in the growth of coal hauling on this proving ground of the network should be expected: this will lengthen the distances that gondolas travel, increase their turning time, and complicate still more the problem of supplying the coal-loading railroads with empty rolling stock.

All this requires constant improvement in the system for regulating the flow of empty and loaded cars in support of uninterrupted fuel hauling. Special attention should be paid in Order No 30Ts to developing and introducing an effective system for furnishing the railroads with means for shipping.

The Routing of Loaded Cars on Coal-Loading Railroads

Let us examine some questions of organizing the supply of cars for loading coal. This will concern three trunk lines--the Donets, West Siberian and Tselina railroads, over which the overwhelming majority of gondolas are being routed.

Analysis indicates that 77 percent of all gondolas that arrive on the Tselina Railroad are empty, 60 percent are empty on the Donets Railroad, and 49 percent on the West Siberian. Thus, shipment in through service, that is, by means of gondolas that arrive from without, is provided for by about half by released cars only on the West Siberian Railroad, while on the Donets and Tselina railroads the requirement for means for shipping is being satisfied primarily through the arrival of empty gondolas. Meanwhile, it is perfectly obvious that the greater the number of gondolas that arrive loaded (for unloading), the fewer the number of empty gondolas, consequently, that will have to be transferred over long distances. This circumstance will have a considerable effect on reducing empty runs and, accordingly, on improving economic indices.

On the other hand, an increase in the flow of loaded cars on a railroad will improve conditions for receiving means of loading. It can be said that an increase in the share of loaded gondolas in the total receipt of means for shipment not only is extremely advantageous economically but it also sets up a firmer foundation and stabilizes the supply of cars for the coal-loading trunk lines.

What is happening in practice? An analysis of data concerning shipments of the network to the coal-loading trunk lines that are being examined indicates that the loading of gondolas has remained at practically one and the same level for many years. But yet the regions that we are speaking about are large economic complexes and there, as everywhere in the country, the economy is being developed, consumption is increasing, and not only exports but also imports are rising. Hauling on these trunk lines is not standing still--its volume grows each year. Then why does not the same thing happen with gondolas? Why does not the loading of gondolas for destinations in coal-mining regions increase over a period of many years? It is thought that the sources of this phenomenon should be sought in deficiencies in planning shipments in gondolas. It is known that, because of the limited availability of gondolas, the railroads do not completely satisfy the national economy's requirements for hauling freight in this rolling stock. But it is one thing to restrict the loading of gondolas to a railroad that dispatches them on regulated tasks, and it is something else to restrict loadings to coal-loading railroads when each restriction on such loading results in a need to send there a corresponding additional number of empty cars.

It should be noted that, despite the numerous instructions that prohibit such restrictions, the hauling-planning sections of the railroad administrations accept requests for loading gondolas without considering this circumstance, and for freight that is being sent to the Donets, West Siberian and Tselina railroads they call for the allocation of flatcars or boxcars, although it can be transported in gondolas.

Having in mind the need for the priority use of gondolas for hauling fuel and ore and metallurgical raw materials, main administrations for traffic and for freight have established for the railroads percentage norms for the use of gondolas for each type of freight. In principle this measure is correct, but it must be substantiated when it is applied to solving the question of shipments to coal-loading railroads.

Development of the haulage plan on some railroads is still being approached without a deep analysis of loading by destination, only local haulage requirements are considered, and the requirements of the railroads of destination are not considered. And the experience of railroaders of the Chusov Division, where the planning and turnover of rolling stock for loading took into account the requirements of the railroads of destination for shipping products in the various types of cars, is completely and undeservedly forgotten and is not being used.

In considering the persisting necessity and desirability of increasing the flow of loaded gondolas into areas of large-scale coal loading, workers of planning and traffic-services sections should examine the external transport links of the most important freight receivers that are on these trunk lines with a view to switching the delivery of products to them in gondolas.

Nor are the possibilities for integrated regulation of car fleets being used adequately for this purpose. This method, as is known, places empty and loaded gondolas on an equal footing and allows the railroads being regulated the potential to increase loadings through a corresponding reduction in the transfer of empty cars. However, an anlysis of shipments on the coal-loading railroads indicate that not even the planned number of loaded gondolas arrives on the West Siberian and Tselina railroads. The plan for loading gondolas to go to the Donets Railroad is not always carried out, although there are enough of the appropriate cars on the neighboring Southern, Dnepr and Odessa-Kishinev railroads.

A number of railroads do not take steps to provide for the planning loading by destination, the main attention being paid to fulfilling the norm for sending empty cars. And indeed the scale of underloadings, especially to the West Siberian Railroad, reaches 300-400 gondolas per day in some months. It is not surprising that this and the other railroads constantly experience a severe shortage of gondolas.

Why is this happening? The cause here should be sought chiefly in the fact that the existing practice in performing the regulatory tasks calls primarily for supporting the plans for collecting and sending out empty cars. Proper attention is not being paid to solving other regulatory tasks, including loadings in the empty direction. Restrictions on loading gondolas frequently are introduced in order to intensify, albeit temporarily, the flow of empty cars to the coal-loading railroad. Let us say it directly: this at times proves inevitable where traffic difficulties are permitted on some routes and there is a low level of operator discipline on certain railroads.

The basic deficiency lies in the fact that the railroads do not properly monitor the consignee or the destinations to which shipments are restricted. And often it is shipments to the coal-loading railroads that are reduced.

Even the existing system of reporting the execution of integrated regulation does not stimulate a precise flow of loaded gondolas to the coal trunk lines. It is known that the list of destinations that are included in the system for integrated regulation embraces dozens of railroads on the routes followed by the empties. It is proposed that all of them load up rolling stock in the passing direction and that a continuous above-plan flow of gondolas go to the coal-shipping trunk lines for unloading.

However, in practice, most railroads have not been fulfilling the plan for through-service shipments for many years. There is a multitude of causes here, but we will not mention them right now. The question basically is whether, under these conditions, it is desirable to record the incidental loading of gondolas, let's say, of the Caucasus Railroad to the Azerbaijan Railroad, the Oktyabr'skaya Railroad to the Moscow Railroad, and the L'vov Railroad to the Northwest Railroad, and so on, as successes in fulfilling the plan for integrated regulation without considering whether the goal for shipments to the coal-loading railroads has been met.

It is no accident that, under this system of reporting, many railroads, in carrying out integrated-regulation tasks, do not fulfill the plan for loading by destination to railroads that load coal on a large scale. Here is a typical example: in July 1978 the capital trunk line loaded 3,000 cars above plan on railroads that were included in the sphere of integrated regulation for car fleets without having carried out, at the same time, the plan for shipments to the Donets, Tselina and East [sic] Siberian railroads that is, to the largest customers for empty gondolas. The Southeastern Railroad overfulfilled the plan in July, but even here the plan for loadings to the same Donets, West Siberian and Tselina railroads was missed.

While, for the network as a whole, the railroads that are customers for empty rolling stock experienced a large deficit in the number of cars received, the plan for loading on routes traveled by empty cars was overfulfilled by almost 2,000 cars.

Obviously, it is desirable to review the list of destinations are included in the system for integrated regulation with a view to stimulating shipments primarily to [illegible] railroads that need empty cars, that is, the railroads that make large scale shipments, and not to those that are in between. And in every case the possibility of fulfillment of the plan for shipping under the integrated regulation should be excluded if the plan for shipping to railroads that receive empty cars is not fulfilled. This will not only raise the stature of the integrated regulating system but it will also establish realistic prerequisites for increasing the flow of loaded gondolas that are to be unloaded on the railroads that make large-scale coal shipments, which is especially important.

It is necessary, moreover, not only to strictly penalize each case of a deficit in sending gondolas to these regions but also to seek out all possibilities for increasing the routing of loaded cars to these places. Plans for haulage from other railroads of the network to the Donets, West Siberia and Tselina trunk lines and to other coal regions should be carefully reviewed, and, in a mandatory procedure, other rolling stock that is to be sent there should be replaced by gondolas. In brief, activity in the work to increase the loaded portion of the cars that arrive from without to support coal shipments must be stirred up in every way.

However, it can be said that a growth in the flow of loaded gondolas through a reduction in the number of empties is not so suitable to the receiving railroads. Of course, it is simpler to operate with empties, and their turnaround is quicker. But it follows from this only that where the ratio of the loaded and the empty portions of the regulated car flow versus the established operating plan is changed, a corresponding revision of the norms should be introduced.

Organizing and Supplying Empty-Car Traffic

And still to this day, empty gondolas predominate in the cars that are supplied to coal-shipping lines. This is the most active part of the

resources for loading. Strict monitoring has been established over the furnishing of these cars, and they are routed right away for coal loading.

Of course, the rhythmic provisioning of the coal-loading railroads with empty gondolas depends primarily upon the status of discipline in the regulatory activity and the level of organization of traffic. Whatever the measures and the plan for transferring empty rolling stock, if traffic is slow and the railroads fail to fulfill the task for turning gondolas over for unloading, then here, obviously, these elements of the hauling process must be restored to normal functioning.

At the same time, in order to supply coal-loading regions fully with empty gondolas, the use of these measures alone will not be enough. As many years of experience indicate, the existing principle for counting the fleet of empty cars must be reviewed. At present, in solving this question, the approach to any railroad is the same. The points at which the arrival of empty gondolas is planned, for example, is not considered. And indeed, for the Donets Railroad, for instance, it is not at all clear whether and in what numbers the cars enter from the Southeastern Railroad, that is, directly to the Debal'tsevo Division, or, let's say, from the Southern Railroad, from where they must be transferred to Debal'tsevo. Also, it matters to the West Siberia Railroad how many gondolas enter from the Alma-Ata Railroad or whether they all come through the most distant entry--from the South Urals Railroad.

Moreover, a distinguishing feature of loading coal lies in the fact that the cars for shipping it should be delivered in accordance with strictly fixed dates. For instance, is it possible to compute under a single scheme the gondola-fleet requirement for, let's say, the Southwestern Railroad, where 90 percent of all loadings into gondolas consist of coal? If to this is added the fact that the flow of empty cars to coal-loading railroads arrives, as a rule, all at once, in the later parts of the day, and, moreover, in large amounts in an unorganized form, and, prior to being turned over for loading, much above-norm time is spent preparing the gondolas, especially for coking coal, then it becomes clear why, given the existence of a norm for empty rolling stock and a restriction on turning gondolas over for all other freight, coal loading is still being supplied with empties with very great strain. The conclusion is obvious: the specific operating conditions of the coal-loading trunk lines must be considered.

Organization of support of the flow of empty cars is of great importance. As experience indicates, a major portion of empty gondolas is transferred from the railroads that are regulated, not in organized unit trains, but as single cars or small groups of them. They travel in mixed-destination trains and are handled repeatedly at classification yards en route. The West Siberian Railroad, for example, receives up to 40 percent of all arriving gondolas in mixed-destination trains. These figures are large also on the Donets and Tselina railroads. This hampers the forwarding of gondolas to places where coal is shipped on a large scale, and it slows their turnaround.

The plan for making up unit trains of gondolas is far from being perfected. It enables the railroads that turn over gondolas to dispatch them in large numbers in mixed-destination trains, and, as a rule, it does not call for the amalgamation of separate groups into unit trains on the routes that they travel. Often all the gondolas from all points are brought together at classification yards, although there is not always a necessity for this. Every railroad has places for the scheduled large-scale unloading of gondolas, at which the permanent dispatching of made-up unit trains can and should be organized without a stop at classification yards.

The procedure for supplying empty gondolas to coal-loading railroads is of considerable importance. It would be ideal to supply them strictly according to a schedule and uniformly by periods of the day. But under the actual situation with regard to unloading and traffic organization, it is not realistic to count on such an approach. Obviously, some sort of a firm nucleus must be created for unit trains that proceed in support of loadings, at least at the most important points.

How is this to be done? On each railroad that turns over empty gondolas, the amounts of unloading exceed by far the norms for transferring them empty in accordance with the regulatory task. There also are points of origin where the empty car flow has been stable for many years. On the Oktyabr'skaya Railroad, forwarding consists of less than 10 percent of the gondolas unloaded. The main region for origin of the empty car flow is the Leningrad Terminal. In the first postwar years unit trains made up of empty gondolas were regularly dispatched from here on schedule to Vorkuta for coal loading. Right now there are no such strictly fixed "strands" over which such trains would proceed. As a result, the flow of empty cars is transferred on the basis of local circumstances for organizing the hauling process on the railroads and the divisions. But is it so complicated, let's say, to dispatch four or five unit trains per day from a terminal over definite "strands"?

Or another example. On the Kuybyshev Railroad, which turns gondolas over for the eastern trunk lines, the dispatch of local gondolas consists of less than one-third of the gondolas unloaded on the railroad. And the regions that originate strings of empties are practically permanent. Meanwhile, local gondolas are turned over as though they were through cars, in the last moments of the day. Is it indeed impossible for the railroad to establish a procedure under which, as a minimum, seven or eight unit trains of empty cars that the railroad itself makes up would be dispatched strictly on schedule and turned over to the Kropachevo Railroad Yard of the South Urals Railroad at a definite time of the day? This would bring discipline to placing gondolas on a run and transferring them in accordance with the prescribed regulating task.

A simple calculation indicates that where each railroad that turns over gondolas transfers even a small portion of the unit trains strictly on schedule, and where their forwarding is strictly monitored, a guaranteed, stable system for providing the most important coal-loading points with empty cars can be established.

The "named" unit trains of empty cars should be recalled here. About 30 years ago, when the coal-loading situation in the Donbass [Donets Coal Basin] was extraordinarily complicated, progressive train dispatchers of the Zaporozh'ye Division, based upon state concern for providing the national economy with fuel, began to make up and dispatch special integral special-purpose unit trains to definite coal-loading railroad yards. The "named" trains that were then organized on the Zaporozh'ye Division played an important role in supporting regular operation of the Antratsit Railroad Yard, the largest in the Northern Donbass. The dispatchers competed in the successful preparation of unit trains, speedy unloading, the accelerated collection of empty gondolas, and the forming of the trains. With special thoroughness they inspected and repaired cars so that the unit train would not include faulty cars.

Competition for the organization and speedy forwarding of Zaporozh'ye-Antratsit unit trains then covered not only the railroad yards of the Zaporozh'ye Division but also all the associated sections and terminals. Dispatchers of the Dnepropetrovsk and other divisions joined it. The railroaders of other trunk lines also took an active part in making up "name" trains. The organization of such unit trains became a popular and active form of socialist competition for the collectives of the regulating railroads that enabled unit trains of empties to be formed and to travel on schedule and helped considerably to improve the Donbass's supply of empty cars.

The "name" trains yielded great benefit also in improving support of the coal-shipping Kuzbass-Usyata Railroad Yard, then the largest.

Why not revive this valuable initiative, which was made one of the important elements of a system for supplying coal-loading regions?

Another portion of this system could be the wide introduction of shuttle haulage of fuel or, in other words, round-trip unit-train operation. Such a form of haulage, as experience indicates, justifies itself completely.

A classic example of it is the organization of haulage in round-trip ore-concentrate unit trains from the Kola Peninsula to the Cherepovets Metallurgical Plant. Operating over a period of many years, this system has provided a stable supply of raw material for the most huge metallurgical plant and timely dispatch of finished output from the Olenogorsk and Kovdor mining and concentrating combines, and it helped to increase the weight norms on an important route of the network.

Known experience in organizing round-trip unit trains has also been gained in hauling coal, particularly from the Ekibastuz field to the Troitskaya, Reftinskaya, Pavlodarskaya, Petropavlovskaya and Karagandinskaya (No 2) electric-power stations and from the East Siberian Railroad to the Tomusinskaya and Novosibirskaya (No 3) electric power stations. It is true that in some cases here the return of empties in unit trains still has not been completely organized, but nevertheless the positive results of such a haulage system have not been slow in showing up. All chance in

supplying these enterprises with fuel has been practically eliminated, and the coal-shipping points have regularly received the unloaded gondolas in empty condition.

However, these are as yet only small, timid steps. They can and should be expanded considerably. What can be done is evident in this example. On the West Siberian Railroad, coal from the Kiyzyak Railroad Yard has not been shipped out with completeness for many months. The main cause is the lack of an established supply of empty gondolas, which often do not get as far as this railroad yard, which is at the south of the Kuzbass [Kuznetsk Coal Basin].

Meanwhile, according to the plan, large lots of coal should be shipped out daily from the Kiyzyak Railroad Yard for the Cherepetskaya, Tol'yattinskaya and Ozherel'yevskaya electric-power stations, and also for Barnaul'skaya TETs No 2 and Novosibirskaya TETs No 4, which are on the West Siberian Railroad. If the haulage of coal for these electric-power stations were to be organized as round-trip unit trains, then the railroad yard, whose supply is complicated, would obtain a permanent guaranteed return of empty gondolas, and highly important power stations would recive a steady supply of fuel.

No few similar examples can be cited. More than half of the coal hauled in our country is sent to electric-power stations and by-product coke industry enterprises. Basically, these are large customers that receive daily several unit trains loaded entirely with coal. The gondols are returned empty after unloading, and, consequently, there are no special obstacles to their rapid return for repeat coal hauling.

The organization of tround-trip unit trains for hauling coal requires, naturally, serious preliminary preparation. Primarily, it is necessary to provide for the stable assignment of coal mines to definite coal customers. Many customers, including power stations, now are often reassigned from some coal mines to others, and orders for shipping coal are needlessly fragmented. This, of course, should not be.

Round-trip unit trains should, as a rule, be heavily loaded, to enable the most effective use of the throughput capability, especially on the heavily traveled routes over which mainly coal is hauled. This will help to raise the through-service factor of the car flow and, as was emphasized in Order No 30Ts, it will become an active means for accelerating car turnaround.

It stands to reason that the best results in this matter can be achieved only with an acceleration of loading and unloading operations at the terminating railroad yards. Round-trip unit trains should be viewed as an essential part of the single operating process of mining and hauling coal to electric-power stations, and the railroaders are not the only ones who should be concerned about them. Coal shippers and receivers should do everything that depends upon them to intensify their loading and unloading potentials.

It is desirable to work out a set of measures that will enable closed-ring unit trains to be introduced in constant rotation on routes with stable freight-traffic volume. Such unit trains should be formed from gondolas that are equipped with roller bearings. This will enable a reduction in the uncoupling of the cars because of journal-box friction, will raise train-traffic speeds, and will reduce lubricant losses during car-tipping.

It is natural that, in creating closed-ring unit trains, the possibilities for reducing empty car runs while being returned from unloading points for repeat loading must be considered.

As was noted during the December 1977 CPSU Central Committee Plenum, coal now occupies and will henceforth occupy an important place in the country's fuel and power balance. Coal, at the same time, continues to be one of the most important and largest in scale of freight items, and it determines to a great degree the level of haulage on the network. During the last 2 years of the five-year plan, the amounts of coal dispatched by the railroads grew again by more than 20 million tons. In prospect is a further substantial growth in the mining and transporting of this solid fuel. Organization of the supply of gondolas for the coal-loading railroads, on which success in sending coal from underground and strip mines to electric-power stations, factories and plants depends to a great extent, is of great importance under these circumstances.

This article has examined only certain questions that are connected with improving the way that furnishing coal-loading railroads with empty gondolas is organized. Further improvement of this system and the provisioning of a stable supply to the coal-shipping regions of cars for loading will create a firmer foundation for uninterrupted transportation of the fuel.

11409
CSO: 1822

BRIEFS

TUBE MILL BEGINS PRODUCTION--A tube mill in Kharzysak in the Ukraine has begun producing multilayered pipe which will withstand pressures up to 120 atmospheres. The pipes, designed primarily for natural gas pipelines in the Arctic region, will be fabricated from several layers of ordinary steel plate. They will thus be cheaper than conventional pipes having monolithic walls because the use of expensive alloying agents can be dispensed with. By increasing gas pressure to 120 atmospheres, a 50-percent increase in pumping capacity can be achieved. The Ukranian tube mill will produce 50,000 tons per year of this multilayered pipe. [Text] [Bonn DIE WIRTSCHAFT DES OSTBLOCKS in German 9 Mar 79 p 5] 9160

CSO: 1826

MANPOWER: LABOR, EDUCATION, DEMOGRAPHY

FORECASTS, OPINIONS OF POPULATION TRENDS

Tselinograd FREUNDSCHAFT in German 10 Apr 79 p 4

[Text] The never before, sudden reduction in the number of births in the developed countries causes governments concern regarding the insufficient reproduction of the population and the "aging of society" (reduction of the percentage of youth). This was mentioned at the latest meeting of the UN population commission during the discussion of the report which contains the latest world statistics.

It appears that the old prognosis, which once caused skeptical smiles, is coming true: The world expects an underpopulation, a shortage in the work force, which threatens to become a serious problem. This is what one of the leading Soviet prognosticians, Igor Bestushev-Lada, co-president of the Committee for Future Research of the International Sociological Association, wrote in his book "Contours of the Future" (Moscow, 1965). This sounced like a naive challenge to many authorities in the West who maintained that the only real problem facing humanity is overpopulation. And what do we have today?

The slow but sure changes in the demographic situation in the last 15 years have caused scientists to become more specific in their calculation, says the above-named report of the UN commission. Until recently they were of the opinion that the population growth, which had increased rapidly in the 20th century, would continue to accelerate in the next years. This opinion has now changed. The culmination does not lie in the future, it lies in the past, and seen in this perspective, a further slowing trend must be expected. A noticeable reduction in the number of births can be seen here: In the developed countries beginning in the 1950's, and in the developing countries beginning in the 1960's.

This tendency is constant, global and applies even to basically different countries in West and East, including such densely populated countries as China (950 million) and India 630 million). The fallibility of the "demographic bomb" speculation is becoming ever more apparent.

Until recently it was estimated as follows: If the number of births were to remain at the reached maximum level (under the condition that average life

expectancy reaches 75 years), then, in the year 2070, there would be more than 25 billion inhabitants in India, approximately 21 billion in China, almost 4 billion in Bangladesh, more than 3.5 billion in Brazil. But all reputable Soviet and foreign prognosticians reject this theory. Following are sober projections for the year 2050:

China--1,270 million inhabitants, India--1,002 million, Brazil--192 million, Bangladesh--155 million, Nigeria--135 million, and USSR--335 million inhabitants. And then?

Prof Boris Urlanis has calculated that from the middle of the 21st century on, the population will in all probability no longer grow and will hardly surpass 12 billion. The UN experts had previously given different figures: from 7.5 billion in the year 2050 to 35 billion in the year 2150, etc. But then the highest number was reduced. Today, most scientists agree on the number of 12 to 15 billion people at the end of the 21st century.

Natural resources and productivity reserves, on the other hand, allow for 157 billion people according to Japan's nutritional standrads, or, according to the highest nutritional standard, 47 billion, according to the well-known economist Colin Clark (England) with reference to the work of Prof Konstantin Malins (USSR) and other experts. The UN estimate (up to 76 billion) is probably more precise. These problems were brought up at the world conference on population problems (Bucharest, 1974).

At present we may not overlook the fact that millions of people starve annually (up to 30 million in bad harvest years), and that chronic malnutrition is the fate of nearly 1 billion people. The young nations suffer from a tremendous overpopulation in the country due to insufficient technological development. The disquieting forecast of the International Labor Bureau in Geneva also must not be ignored: By the end of the 20th century, at least 1 billion new jobs must be created for full employment in the world; otherwise, the number of "superfluous people," which has already reached 300 million, can triple by the year 2000. But there are 800 million illiterate people living on this earth. What sort of cadre can they provide?

In spite of this, there is no room for pessimism. Let us take an example from the recent history of our country. The percentage of illiterate people in the Russian Empire was higher than it presently is in the countries of Asia and Latin America, and almost as high as in Africa (74 percent). This was the heritage which our Soviet country, born from the Great Socialist October Revolution, received. The disorder following the two wars--World War I and the civil war, worsened the situation, as did the economic blockade from abroad. But in spite of the difficulties, our country overcame its backwardness in less than the lifespan of one generation. The USSR had already become industrial giant No 2 in the 1930's. At that time compulsory elementary education was introduced (recently compulsory middle school education). In the year 1930 there was no longer any unemployment (after 13 years). The industrialization of the country, collectivization of agriculture and the cultural revolution contributed to that.

There are still enough problems today, of course. One of them is the lack of work resources. One solution would be intensifying production, but not, of course, at any price: Because the sweatshop system is alien to socialism. Better organization, mechanization and automation in the interest of all and each individual save personal labor. Sooner or later, work will become 20 times as productive as today.

The need for workers will be considerably reduced. But not the need for intelligent individuals: There will continue to be a lack of specialists in various fields. And there is likely to be a lack of highly qualified workers, technicians, engineers and scientists in the future.

In a society where there is no antagonism between work and capital, the robot will never become man's enemy. In our country, the administration may not discharge a "superfluous" worker without first providing another job for him. According to law, it is obligated to guarantee him retraining when changing jobs. When machines compensate for a lack of workers, again there will be no one who is superfluous. It merely provides the possibility to shorten the work day, (while keeping the salary and the workers at the previous level).

Many nations have chosen to follow in the trail which the world's first socialist state has blazed. It is the way of a sure development without crises. Problems? They exist and will continue to exist. But were those problems which have already been solved any simpler? Mankind is capable of handling the new tasks, however complicated they may be. International cooperation, securing of the peace, abandoning the armaments race will help to solve them. Only think: The latter consumes more than 400 billion dollars per year. With 125 billion dollars, one could supply the poorest in the world for a period of 10 years with food, medical care and many other things. How will it be, when dozens of heads and hands which now produce weapons, devote themselves to peaceful work? Would that not hasten the solution of the most varied demographic, economic and ecologic problems?

9328
CSO: 1826

MINERALS

BRIEFS

ANYUYSK PLACER MINE--The Vesenniy sector of the Anyuysk placer mine has already fulfilled its May plan by 110 percent. The Oktyabr panwashing artel has fulfilled its monthly plan by 102 percent. Both collectives have pledged to extract additional gold above their plans by the end of the month. [Magadan Domestic Service in Russian 0755 GMT 25 May 79]

MAY GOLD PLAN--The Dvadtsat Pyat Let Oktyabrya placer mine is the first in Susumanskiy Rayon to fulfill its May gold extraction plan. Open pit No 2 has already fulfilled two monthly plans. [Magadan Domestic Service in Russian 0755 GMT 25 May 79]

BERZINA PLACER MINE--It has been reported from Yagodnoye that open pit No 2 of the Berzina placer mine fulfilled its May gold extraction plan yesterday and has pledged to exceed its monthly plan by 30 percent by the end of the month. [Magadan Domestic Service in Russian 0755 GMT 25 May 79]

DALNIY PLACER MINE--The Dalniy placer mine fulfilled its monthly gold extraction plan yesterday, the first to do so in Tenkinskiy Rayon. Best results at the mine have been achieved by the Gvardeyets open pit, which has already fulfilled its May plan by 126 percent. The Mariny Raskovoy sector has also fulfilled its May plan. [Magadan Domestic Service in Russian 0755 GMT 29 May 79]

VOSTOCHNYY PLACER MINE--The Vostochnyy placer mine has pledged to extract 6 percent gold above its annual plan. [Magadan Domestic Service in Russian 0755 GMT 30 May 79]

TENKINSKIY MINING COMBINE--The Tenkinskiy mining and concentrating combine today fulfilled its May gold extraction plan. The combine's placer mines Dalniy and Kurchatovskiy have been extracting gold against their June plan for the past 3 days. The combine's panwashing artels are also working against their (?June) plan. [Magadan Domestic Service in Russian 0755 GMT 31 May 79] All five placer mines of the Tenkinskiy mining and concentrating combine have fulfilled their socialist pledges in (?May). [Magadan Domestic Service in Russian 0755 GMT 1 Jun 79]

YAGODNYY COMBINE--The Yagodnyy mining and concentrating combine has successfully fulfilled its May gold extraction plan. [Magadan Domestic Service in Russian 0755 GMT 1 Jun 79]

IULTIN COMBINE--The Iultin mining and concentrating combine has completed capital repairs to its concentrating factory 2 days ahead of schedule. [Magadan Domestic Service in Russian 0755 GMT 8 Jun 79]

KHERPUCHI GOLD DREDGE--The dredge No 95 of Kherpuchi placer mine is leading socialist competition among Far Eastern gold miners. The collective of the dredge has raised its pledge to overfulfill the annual gold-extraction plan from 5 percent to 25 percent. Since the beginning of the current washing season the dredge has already processed 37,000 cubic meters of gold-bearing sand above plan. [Khabarovsk Domestic Service in Russian 0930 GMT 4 Jun 79]

KHERPUCHI GOLD MINE--The Oktyabrskiy mining section of the Kherpuchi placer mine has fulfilled its 6-month gold extraction plan ahead of schedule. Mining for gold is proceeding in difficult conditions caused by bad weather. [Khabarovsk Domestic Service in Russian 0930 GMT 6 Jun 79]

BURKANDYA PLACER MINE--This year's first gold at the Burkandya placer mine was extracted yesterday at sector No 2. [Magadan Domestic Service in Russian 0755 GMT 17 Jay 79]

GASTELLO PLACER MINE--Dredges Nos 174 and 175 of the Gastello place mine have begun this year's navigation season. [Magadan Domestic Service in Russian 0755 GMT 17 May 79]

UST-OMCHUG DREDGES--The entire dredge fleet in UST-Omchug has opened the navigation season and the mining and concentrating combine has begun receiving reports on metal extraction. By today placer mines have already fulfilled their May extraction plan 23 percent. [Magadan Domestic Service in Russian 0755 GMT 18 May 79]

SREDNEKAN PANWASHING ARTELS--Panwashing artels of Srednekan have decided to support the initiative of the Chukotka panwashing artel of the Komsomolsk mining and concentrating combine to extract 2 percent of the precious metal in 1979. The Pobeda and Dalnyaya panwashing artels have pledged to extract a similar quantity of metal above their plan. Srednekan artels have also pledged to begin operating on a full daily schedule by the beginning of the mass washing season on 20 May. [Magadan Domestic Service in Russian 0755 GMT 18 May 79]

START OF MASS WASHING SEASON--The mass sand washing season officially began today in central rayons of Magadan Oblast. [Magadan Domestic Service in Russian 0755 GMT 21 May 79]

TENKINSKIY RAYON ARTELS--Panwashers in Tenkinskiy Rayon have begun the washing season earlier than usual. The Kolyma and Gornaya panwashing artels fulfilled their May plan today and have pledged to fulfill two monthly plans in May. [Magadan Domestic Service in Russian 0755 GMT 21 May 79]

BERELEKH COMBINE--Open pit No 2 of the Berelekh mining and concentrating combine has already extracted its first metal against the June plan after successfully fulfilling its monthly plan. [Magadan Domestic Service in Russian 0755 GMT 23 May 79]

KHERPUCHI GOLD DREDGE--Dredge No 95 of the Kherpuchi placer mine has fulfilled the 5-year gold extraction plan ahead of schedule. The dredge has pledged to fulfill two more annual plans before the end of the 5-year plan period. [Khabarovsk Domestic Service in Russian 0930 GMT 23 May 79]

VOSTOCHNYY PLACER MINE--The Vostochnyy placer mine, which extracted its first gold today, has pledged to extract 2 percent of gold above its 1979 plan. [Magadan Domestic Service in Russian 0755 GMT 4 Jun 79]

POLYARNYY COMBINE--The mass sand washing season will begin at the Polyarnyy mining combine tomorrow. The combine has pledged to fulfill its 4-year plan by the anniversary of the new USSR constitution and to extract 3 percent of the precious metal above the 4-year plan. [Magadan Domestic Service in Russian 0755 GMT 4 Jun 79]

SEVEROVOSTOKZOLOTO ASSOCIATION--A meeting of the commission to sum up the results of preparations for the washing season was held at the Severovostokzoloto Association today. The Tenkinskiy combine has achieved the best results during the past 5 months. The Yagodnyy combine, which has initiated the oblastwide competition, has won the second place. The Matrosov ore mine achieved the best results in May. Good work has been done by the Burkhala, Sorok Let Oktyabrya, Anyuysk, Vostochnyy and Burkandya placer mines, which have exceeded their plans for gold extraction and other kinds of mining work. [Magadan Domestic Service in Russian 0755 GMT 8 Jun 79]

CSO: 1822

END

END OF FICHE DATE FILMED

July 25, 1979

D.D.